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REPORT

OF A

COMMITTEE OF THE CLINICAL SOCIETY OF LONDON

NOMINATED DECEMBER 14, 1883,

TO INVESTIGATE THE SUBJECT OF

MYXŒDEMA.

SUPPLEMENT TO VOLUME THE TWENTY-FIRST.

LONDON:
LONGMANS, GREEN, AND CO.
1888.

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8435

PRINTED BY ADLARD AND SON, BARTHOLOMEW CLOSE.

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INTRODUCTION.

The Committee of the Clinical Society of London appointed on December 14, 1883, to consider the subject of "Myxœdema," in now presenting their Report, have to state that the investigation has been one of some complexity, and involved the division of the Report into several sections.

In Section I, which is preliminary, a short historical summary of Myxœdema and its allied conditions is given.

In the first stage of their investigations the Committee found it necessary to consider the clinical aspect of Myxœdema. They collected all cases of Myxœdema so far recorded, and they now present in Section II (1) a very full tabulation of all such cases, (2) a detailed analysis of the symptoms, and (3) a general analysis of the symptoms.* The Committee at the same time examined all that was forthcoming in relation to the pathological anatomy of the disease, the results of their labours forming Section III of the Report.

After this, two important lines of observation had to be recognised: (1) the chemistry of the tissues in Myxœdema (Section IV), (2) the results of experimental observations on animals (Section V). The chemistry of the tissues had two aspects, (*a*) that of Myxœdema as observed in man, (*b*) that of the changes of the tissues of animals submitted to extirpation of the thyroid body.

The Committee submit Reports on these subjects.

The next stage of the Report (Section VI) consists of an

* In consequence of their bulk, the tables have been placed at the end of the volume.

analysis and report of all known cases of total and partial extirpation of the goitrous thyroid gland in man.

The six Sections are the basis of the conclusions which form the substance of an exposition of the Committee's unanimous opinion.

In an Appendix are embodied Dr. Stephen Mackenzie's investigations on the weight of the thyroid body at different periods of life, and in persons dying from various causes.

Finally, a Bibliography of Myxœdema is added to facilitate future inquiries.

SECTION I.

HISTORICAL SUMMARY.

In the following account it is intended simply to give a short statement of the more important observations on Myxœdema and allied conditions which led to the appointment of the Committee by the Clinical Society; and of valuable papers bearing on the subject which have since appeared.

A list, as far as possible complete, of the various contributions on the subject will be found in the tables, and in the bibliography.

In the year 1873 Sir William Gull read before the Clinical Society of London a paper entitled "On a Cretinoid State supervening in Adult Life in Women." In this paper Sir William Gull presented a graphic picture of the symptoms belonging to the disease now generally recognised under the name of "Myxœdema." Although this contribution did not deal with the pathology of the disease, the use of the word "cretinoid" appears to have been a remarkable instance of insight.

In 1877, Dr. Ord presented to the Royal Medical and Chirurgical Society of London a communication "On Myxœdema, a term proposed to be applied to an essential condition in the 'cretinoid' affection occasionally observed in middle-aged women." This communication was founded on observations which had begun as far back as 1861, and contained, in addition to clinical facts, the results of pathological investigations made

during and after life. Dr. Ord proposed to apply the name Myxœdema to the disease, on the neutral ground that a mucin-yielding œdema was the chief observable condition. Influenced by Sir William Gull's use of the word "cretinoid," Dr. Ord discussed the relations between what he called Myxœdema, and cretinism both endemic and sporadic. In this paper the condition of the thyroid gland observed at the post-mortem examination was noted, and the microscopic appearance was figured. The gland was found either to have undergone atrophy, or to have had its proper structure replaced by fibrous tissue.

After the publication of this paper, cases of the disease were recorded by observers in various localities, and now for the first time the occurrence of the disease in men became recognised. In 1881, M. Charcot, amongst others, published the results of observations which he had been carrying on for a long time, and which were purely clinical. He proposed the name of "cachexie pachydermique" for the disease.

In 1882, M. Jacques L. Reverdin read a paper before the "Société Médicale de Genève" in which he communicated the results of a number of cases of total extirpation of goitrous thyroid glands, and drew the attention of the profession to a series of symptoms, following such extirpation, and resembling in their entirety the symptoms of Myxœdema. No reference, however, was made at this time to the correspondence of these symptoms with those of Myxœdema, as observed in England. Later on, in a paper bearing date of June, 1883, the relation with Myxœdema was discussed by M. Reverdin. These papers seem to have escaped the notice of all English observers. But between the first and second of these communications Professor Kocher read a paper before the Congress of German Surgeons in April, 1883, in which he described, under the name of "cachexia strumipriva," the symptoms which he had observed to follow total extirpation of goitrous thyroid glands, symptoms attributed by him not to loss of the functions of the gland, but to a condition of chronic asphyxia, which he believed was a consequence of injurious operative interference with the structures of the neck. Dr. Felix Semon, however,

having seen this paper, lost no time in bringing it before the notice of the Clinical Society, and at a meeting of that Society held on November 23rd, 1883, pointed out the remarkable and complete resemblance of the symptoms following total extirpation of the thyroid gland, as described by Kocher, with those of Myxœdema as observed in England. Dr. Semon then argued for the existence of a common condition, probably a causative factor, in Myxœdema, cachexia strumipriva and cretinism, viz. loss of the function of the thyroid body. This view was subsequently adopted by Kocher.

About a year later Paul Bruns published a case in which the extirpation of the thyroid gland in a boy of ten had been followed by the conditions hitherto described in this country under the head of sporadic cretinism,—conditions in which the symptoms of Myxœdema, occurring in a child, had been complicated by various arrests of development. The several observations here noted appeared to the Clinical Society of London of sufficient importance to induce it to appoint a Committee of Investigation on the entire subject of Myxœdema and its allied conditions. Soon after the appointment of the Committee Mr. Horsley commenced an experimental research into the effects upon monkeys of removal of the thyroid gland. Schiff had already shown that removal of the gland in dogs was rapidly followed by death of the animal. Mr. Horsley succeeded in demonstrating that loss of the function of the thyroid gland produced all the symptoms known as Myxœdema and cachexia strumipriva, and, varying the mode of experimentation, obtained strong evidence that cretinism was but a more chronic form of the condition. Among the many papers which have of late been published on Myxœdema it is important to draw attention to that of Professor Virchow, in the *Berliner klinische Wochenschrift*, 1887, in which Myxœdema is recognised as a clinical entity, and in which valuable suggestions, referring especially to the appearance of irritative processes in some of the lesions, are set forth.

SECTION II.

DETAILED ANALYSIS OF SYMPTOMS.*

Age (103).

	Males.	Females.	Total.
Between 25 and 30,	1	4	5.
„ 30 and 35,	1	11	12.
„ 35 and 40,	1	17	18.
„ 40 and 45,	3	10	13.
„ 45 and 50,	3	15	18.
„ 50 and 55,	3	8	11.
„ 55 and 60,	2	13	15.
„ 60 and 70,	1	7	8.
„ 70 and 80,		1	1.

In addition, 1 occurred at 20 and 1 at 13, both females.

Sex (109). Males 15, females 94.

Social condition (90). This is largely of the lower class. Possibly the various grades of society have not been so equally subject to observation and report as to help in the determination of a point of this kind.

Family antecedents (75). Two of the recorded cases were sisters† (42 and 103). Two were "relatives" (65 and 68). In 1 (37) the father, and in 1 (79) the mother, probably died of myxœdema. One (43) a half-sister by the father is probably myxœdematous. "Dropsy" is noted in 5; in 3 (10, 80, and 104) in the mother, in 1 (92) in both father and mother, and in 1 (60) in a sister.

* This analysis is based on 109 cases, which will be found in detail in the Clinical Tables. The number in brackets ( ) indicates the number of answers received.

† Another sister has since been found to be suffering from myxœdema.

Phthisis occurred in near relatives in 20. Neuroses of various kinds are noted: fits in 2, insanity in 4, and diabetes in 3, with others, making 12. Gout is noted in 2, rheumatism in 4, heart disease in 12, apoplexy in 4. In 2 (80 and 103), the father suffered from painters' colic, and, in the latter, two members of the family (42 and 103) are the subjects of myxœdema.

Personal antecedents.

SYPHILIS (57). Absent in 47. Present in 6, doubtful in 4.

ALCOHOL (52). Forty-four were temperate, 8 imbibed more or less.

MENTAL DISTURBANCE (46). Absent in 27. Present in 16, 3 doubtful.

CATAMENIA (69). Irregularities in 37. Sometimes the catamenia were scanty and sometimes profuse. In 7 they disappeared early, and in 2 the disappearance coincided with the onset of the disease.

PREGNANCIES AND CHILDREN. Sixty-nine were married, 62 of whom had borne children; 14 were single, and 1 a prostitute. Miscarriages are noted in 15 cases, but several times only once. Nineteen of the married women are stated to have had no children after the onset of myxœdema. In 6, children were born after the disease was established. In 2 one child only was born, in 2 two children; and in 2 three children. Sixteen had given birth to 8 or 9 children, and 6 of these women had had rapidly succeeding pregnancies. In 2 the symptoms dated from the last confinement. In 5 cases some of the children probably died of phthisis, and in 1 there was a suspicion of myxœdema in an offspring.

Age at which symptoms first noted (84).

Under 20	...	4	$8\frac{1}{2}$ years. 13 „ 15 „ 15 „
20—25	...	8	
25—30	...	8	
30—35	...	17	

35—40	...	12
40—45	...	10
45—50	...	10
50—55	...	7
55—60	...	4
60—70	...	4

Part of body in which œdema first observed (70). General 6. Face 22, eyelids 9, eyelids and hands 3, face and limbs 3, face, hands, and feet 1; "throat" 1; neck, body, arms, face in order 1; supra-clavicular region 3; hands 3; hands and feet 2; hands, then face, and finally legs 1; feet 2; right foot 1; feet and legs 1; legs 4; feet, legs, face and hands 1; left ankle 1; abdomen 3; belly, then hands and feet 1; "stomach" and legs 1.

Residence, past and present (76). England: London 27, London and Birmingham 1, Surrey 1, Essex 1, Kent 3, Kent and at sea 1, Hampshire 1, Somerset and London 1, Worcestershire 1, Staffordshire 1, Wolverhampton and Birmingham 1, Salop, Liverpool and London 1, Liverpool and Kendal 1, Yorkshire 1, Durham 2, Northumberland 2.

Scotland: Paisley 1, Montrose 1, Dundee and Montrose 1, Glasgow 1, Aberdeenshire 1.

Ireland 1, Tipperary and London 1.

Foreign: France 15, viz. Paris 2, Montpellier 1, Brest 1, Brittany 11; Ionian Isles, France and London 1, Geneva 1, Germany and Glasgow 1, United States (Kentucky) 1.

Damp locality 1, aguish district 1, nomad 2.

Bulk (50). In 4 the bulk had apparently not increased. In 2 it was noted as moderate, but with these exceptions there was more or less increase, in many cases to a very great extent.

Weight (31). "Not noted" in four. In 5 there was stated to have been an increase in weight. In the remaining 22 the weight is given without reference to increase. Lowest 6 st. 4 (excluding case of a child æt. 13, whose weight was 4 st. 5), highest 16 st. In 13

the weight was over 10 st., 7 of these being over 12 st.

Physiognomy (75). Physiognomy is described as "cretinoid," "expressionless," "heavy," "apathetic," "mask-like," "vacant," "stolid," "good-tempered," "blunted," "large-featured."

Face (102) and Body (78). These are described so uniformly that it is unnecessary to give numerical details. It may be noted that moles existed in 11, warty growths in 1, and small fibromata in 1; pigmentation is described in 3, enlarged lymphatics on the body in 1.

Supra-clavicular region (51). Normal in 13. The presence of fulness or of fatty tumours is noted in 33. Five doubtful.

Vulva (12). Normal in 4. Swollen in 3, dry or scaly in 3, 1 had been swollen. One noted as "not examined."

Extremities (97). The description is so uniform that it is unnecessary to give numerical details. Warty growths on the arms are noted in 2, moles in 1, brown patches in 1, purpuric spots in 2.

Nails (44). Normal in 18. Doubtful in 5. In the remaining 21 they are variously described as stunted, cracked or split, broken, brittle, striated, grooved, ridged, thick, and in one much hypertrophied.

Hair (74). Nothing abnormal noted in 7. In the remainder the hair is described as soft, crisp, fine, dry, friable, or brittle. More or less baldness is noted in a very large number; in others the hair is scanty or thin. The eyebrows, eyelashes, the hair on pubes and in axillæ are especially noted as absent or deficient in a considerable number. In one there was universal alopecia.

State of thyroid gland, past and present (59). Normal in 9. Condition uncertain in 23 (including those described as "not to be felt"), atrophied or "small" in 22, in 3 of which previous enlargement was noted; hypertrophied in 4, hard in 1.

Temperature (60). The method of observation, the frequency of observation, and the mode of presenting the results, vary very widely. Nevertheless, the conclusion to

be drawn from the whole is that a subnormal temperature was most commonly present. In only 8 cases is the word "normal," or a statement equivalent thereto used. In a few cases the temperature is recorded to have risen to 99° or higher, in none to more than 100°. In all of these, save one, the average temperature was subnormal, the exception being a single observation. In 10 cases very low temperatures are noted—between 93° and 95°. In one 77° is registered as having been taken shortly before death. The conclusion is absolutely to the effect that the temperature in myxœdema is decidedly below the normal standard.

Presence of watery dropsy (pitting, ascites) (72). Absent in 40, but in 2 œdema has been previously noted. Pitting is noted in 27. In 15 of these it is recorded as "slight," in one ascites was present, and in one there was a history of its previous occurrence. In nearly all the 27 cases the œdema affected the extremities, mainly the ankles, but in 3 the eyelids and in 2 the trunk were said to be œdematous. In 2 there was occasional œdema. Three doubtful answers.

Sensation.

Lost (38). No loss in 26. Total loss in 1, partial in 4, general impairment in 6. One doubtful.

Perverted (36). Not perverted in 31, partially perverted in 4. One doubtful.

Delayed (46). Not delayed in 21. More or less delay in 22, partial in 2. One doubtful.

Heat and cold (20). Normal in 8. Intensified (generally for cold) in 6, delayed in 2, diminished in 4.

Subjective sensations (60). Absent in 4. Coldness in 36, frontal headache in 12, pains and heat at vertex of head in 5, noises in the ears, vertigo, or tinnitus in 7, disagreeable smells and tastes in 9, pricking and tingling sensations of skin in 8, partial numbness (especially of limbs) in 7, rheumatoid pains in one. One not specially defined. In many cases several subjective sensations co-existed.

Occipital headache (48). Absent in 26. Present in 22.

Motion.

Paralysis (43). Absent in 41. Present in 2, but apparently due to accidental causes.

Paresis (66). Absent in 35. Present in 29. Doubtful (but apparently present) in 2.

Retardation (76). Absent in 5. Present in 71.

Inco-ordination (59). Absent in 20. Present in 39.

Convulsions (45). Absent in 37. Present in 8.

Reflexes.

Superficial (32). Absent in 5. Present in 20, diminished in 7.

Deep (45). Absent in 3. Diminished or delayed in 13, probably exaggerated in 6, normal in 23.

Intellectual changes Slowness (60).

Absent in 3. More or less marked in 56, doubtful in 1.

Abnormal persistence in thought and action (29.)

Absent in 22. Present in 7.

Imperfection or perfection of mental processes. (41).

Imperfection in 15, perfection in 26.

Writing (33).

Good in 12, slow in 7, more or less inability in 8. 6 were illiterate. (Specimens of handwriting were sent in 4 cases, but no opinion given).

Irritability (53).

Absent in 19. Marked in 32, placid but fretful at times in 2.

Sleep (73).

Good in 37, bad and disturbed by dreams and sensations in 25, drowsiness during the day (both in good and bad sleepers) in 17, variable in 1.

Delusions (46).

Absent in 28. Present in 18.

Hallucinations (43).

Absent in 27. Present in 16.

State of memory (71).
Good in 25, defective or bad in 46.

Insanity (45).
Absent in 29. Present in 16.

Agoraphobia (33).
Absent in 21. Present in 12.

Changes in speech (104).
Absent in 4, marked in 100.

Eyes and vision (83).
Normal in 46, various impairments in 37.

Ears and hearing (60).
Normal in 27, impaired in 32, 1 doubtful.

Nose and smell (54).
Normal in 36. Smell impaired in 11, perversion of smell in 1, watery discharge from nose in 6.

Taste (47).
Normal in 27, defective in 18 (total loss in 1), retarded in 1, perverted in 1.

Circulatory system.

Blood (24). No characteristic changes were detected. Normal in 14. In 6 the coloured corpuscles or the hæmoglobin were diminished. In 1 the colourless corpuscles were said to be increased and in 1 diminished. In 1 there was a want of coagulatory power.

Heart (100). Normal in 54. In 23 the sounds and action were weak without further evidence of disease. In 12 the second sound was accentuated. Reduplication of the first and sometimes of the second sounds, palpitation, irregular action, enlargement, hæmic murmur at base, systolic aortic, systolic mitral, and præsystolic murmurs were noted in a small number of cases.

Arteries (84). Normal in 39. Atheromatous or thickened in 5 only. In 29 the pulse was weak, soft, and slow, while in 5 there was high tension. Slight irregularity and occasional intermittence were found in isolated cases.

Veins (31).	Normal in 24. Dilatation in 3, congestion in 3, and hæmorrhoids in 1.
Capillaries (45).	Normal in 7. In 38 dilated or congested on the nose, lips, and cheeks.
Respiratory system (70).	Normal in 56. In a few cases the respirations were slow (10 to 18 per minute) and the respiratory sounds feeble. In 15 there was slight bronchitis or cough, in 2 pneumonia (both fatal), in 1 phthisis, in 1 pleurisy, and in 1 slight congestion and defective tension of vocal cords.
Digestive system.	
Deglutition (51).	Normal in 30. In the remainder some difficulty or choking sensation was found, often of the slightest description.
Teeth (71).	Normal in 18. In the remaining 53 they were imperfect in various ways, decayed, broken, and irregular, loose, wholly or partially lost.
Gums (44).	Normal in 16. In 13 they were swollen and pale, or, on the contrary, purple, in 11 spongy and bleeding, or ulcerated, and in 4 œdematous and receding or wasted.
Tongue (91).	Normal in 28. In 52 large, swollen, and flabby. In sparing examples it was excoriated, fissured, and painful.
Uvula and soft palate (48).	Normal (or pale) in 17. In 31 swollen, elongated, stiff and indurated.
Defæcation (74).	Normal in 24. In 44 constipation, with occasional purging in 4. Bowels irregular in 2, frequent defæcation in 1, diarrhœa in 1, and in 2 prolapsus ani.
Lymph glands (38).	Normal in 32. General enlargement in 1, occasional enlargement and tenderness in 1. In 2 the submaxillary were enlarged, the affection dating from childhood in 1 case. In the other there was much tenderness. The cervical glands were swollen in 2 cases, 1 since childhood. Inguinal glands a little enlarged in 1.
Urinary system.	
General state of urine (77).	Normal (or clear) in 44. Excess of mucus in 16,

sugar in 2, oxalate of calcium in 2, indigo in 1, phosphates occasionally in excess, urates rarely.

QUANTITY (61). Normal in 13, diminished in 9. Minimum 12 oz., maximum 7 pints per diem. Uncertain in the majority.

SPECIFIC GRAVITY (66). In 42 it was between 1008 and 1018, in 12 between 1020 and 1030, in 11 between 1009 and 1035. In 1, a case of glycosuria, it varied between 1025 and 1040.

REACTION (56). Acid or slightly acid in 47, alkaline in 2, neutral in 3, in the remainder variable, the acid reaction predominating.

ALBUMEN (90). Absent in 68, occasional or slight trace in 20. A large quantity in 1 case. In 2 albumen was at first absent but afterwards made its appearance.

UREA (29). Normal in 3, diminished in 6, doubtful in the rest, but probably diminished in the greater number.

COLOUR (59). In 12 normal or of an amber tint. In 44 it was light, pale, or straw coloured. In 1 of a reddish-yellow colour.

MICTURITION (42). Normal in 30, too frequent in 8, incontinence in 2, and in 2 some difficulty and slowness.

Sexual system (13). Normal in 6, no sign of puberty in 1, desire lost in 2, prolapse of uterus in 2, sexual feelings in 1, change of life passed in 1.

Occurrence of crises (20). No crisis in 11, excessive perspiration in 1, occasional diarrhœa in 1, in 1 symptoms aggravated at time of epileptic fits, in 1 sudden vertiginous attacks with vomiting, in 1 falling forwards without warning, in 1 sudden short attacks, in which "she can see and hear, but make no sign; afterwards severe perspirations, and cannot speak well for some days." In 1 symptoms aggravated when urine is scanty, 2 doubtful answers.

Other diseases present. See under *Circulatory System, Respiratory System, Urinary System, and Additional Information.*

Progress of case (64). Stationary in 17. Sixteen becoming progressively worse. In 1 recovery after two and a half years,

accompanied by profuse perspirations; in 1 temporary disappearance of the disease during two pregnancies; in 1 marked, but temporary, diminution in myxœdematous condition after pregnancy; in 26 improvement noted, and in 7 of these apparently independent of treatment; 2 doubtful answers.

Mode of dying (12). Pneumonia 3, bronchitis 1, exhaustion 2, coma 2, collapse 1, suffocation 1, increasing slowness of mind 1, much wasting before death 1.

Wasting or change in character of dropsy before death (5). No wasting in 3, increased dropsy in 1, œdema of glottis and lungs in 1.

Treatment and its effects (65). Jaborandi in 12 and pilocarpin in 6. Of these 18, 11 improved. In 3 improvement was great, and in 1 of these hot-air baths were also used. In 5 no improvement, in 2 result not stated.

Nitro-glycerine in 3. Marked temporary improvement in 1, slight improvement in 1, no effect in 1.

Iron, quinine, and sulphur baths caused almost entire disappearance of œdema in 1.

Iodide of potassium in large doses temporarily relieved occipital headache in 1.

Arsenic in 6. Improvement in 1 only.

Antisyphilitic treatment in 4. Improvement in 2, 1 a syphilitic case. In the other phosphorus was also given.

Induced current in 2. Improvement in 1.

Galvanism to the spine probably of use in 1.

Iron beneficial in 4, but in a much larger number no good resulted.

Strychnia or nux vomica in 10. Improvement in 2.

Quinine, hydrobromic acid, phosphorus, cod-liver oil, cold baths, milk diet and "tonics" apparently useless.

Additional information. In 1 symptoms dated from hæmorrhage after operation, and in 1 a suspicion that the disease

followed on hæmorrhage after extraction of a tooth. Hæmorrhages from the throat in 1, from the nose in 1; unusual ecchymoses from slight injuries in 1, healing of scratches prolonged in 1; much salivation in 1, and dribbling of saliva in 2; parotid swellings in 2, and in 1 of these the bones were hypertrophied; acute rheumatism in 8, and in 2 the myxœdema dated from the attack; gout (apparently accidental) in 3. Erysipelas in 4, affecting the face in 3, the hand in 1; 1 occurred about time of onset of myxœdema, and 1 soon after; in the other 2 the erysipelas occurred long before the myxœdema.

In 2 swelling of the body dated from childbirth; in 2 myxœdema was ascribed to prolonged lactation, in 1 to the use of arsenic; swelling at the back of neck in 1; 1 began with insanity; in 2 reactions to the induced current normal, and in 1 reactions to galvanism normal.

* This was probably an instance of the disease recently described under the name of "Acromegaly" (Case 41 in Tables.).

GENERAL ANALYSIS OF SYMPTOMS.

In reviewing the antecedents and coincidents of myxœdema we may, in the first place, note the

AGE. age of the persons affected. By far the larger number of cases occur between the ages of thirty and sixty-five; nevertheless, the onset of the disease may arise during early adolescence or extreme old age. It should be observed here that sporadic cretinism, as first described by Curling and Fagge in this country, and since then by many other observers, is probably to be regarded as the same disease, namely, myxœdema affecting children and adolescents.

SEX. The original observations of Sir William Gull speak of the disease as an affection of adult women. It will be observed, however, that the tabulated statement clearly indicates that men are also affected in a small proportion, viz., one to six of women. It is, however, as a disease of women that the affection has mainly to be studied.

SOCIAL CONDITION. Social condition has probably no influence as a predisposing cause.

FAMILY ANTECEDENTS. There is no doubt that, occasionally, the disease attacks members of the same family related in various degrees, and it is certain that in some cases there is direct transmission from father or mother, chiefly from the latter.

The occurrence of phthisis, and also of neuroses of various kinds, among near relations appears to

be frequent, and must probably be included among predisposing causes.

PERSONAL ANTECEDENTS. SYPHILIS. ALCOHOL. MENTAL DISTURBANCE.

There is no evidence that either syphilis or alcohol has any share in the production of the disease. In some instances it would appear that mental disturbance has a determining influence. But there arise here two questions which can be decided only by careful observations; (1) the magnitude of the disturbance; (2) the innate susceptibility of the patient.

CATAMENIA.

Seeing the great disproportion in the incidence of myxœdema in the two sexes, the relation of the disease with catamenial disturbance demands special investigation. As yet our analysis yields little positive evidence on this point. It is true that in many instances menstrual irregularities are noted, but disturbances of such nature rarely coincide with the onset of the disease. In exceptional cases the symptoms date from the climacteric, yet here again the relation of cause and effect is very doubtful.

It must be borne in mind that alterations in the vascularity of the thyroid appear to occur in association with both menstruation and pregnancy, and that no co-equal association of any kind has been observed in men. This is a point which calls for careful investigation in myxœdematous men with regard to the presence of affections of the prostate and prostatic urethra.

PREGNANCIES.

It is worthy of note that a large proportion of the female patients were married, and that nearly all had borne children. In a significant proportion the child-bearing had been excessive, and in some there had been rapidly succeeding pregnancies Indeed, in a few cases there appears to be little doubt that the early symptoms of the disease date from childbirth, though curiously enough in other instances there is a history of temporary

diminution in the myxœdematous condition during pregnancy.

It is certain therefore that myxœdema is no bar to pregnancy, and furthermore, that gestation may occur and go on to its full period in the advanced stage of the disease.

CHILDREN. In a few cases the children died of phthisis, and in one instance there was a suspicion of myxœdema in a child whose mother was the subject of the disease. In two cases myxœdema

LACTATION. is ascribed to prolonged lactation, in four cases to

HÆMORRHAGE. excessive hæmorrhage, and in eight to acute rheu-

ACUTE RHEUMATISM. matism, in two of which the myxœdema is said to have commenced after the attack.

LOCALITY. Our tables furnish no certain evidence that locality has any influence in causation, though it must be mentioned that eleven cases are reported from Lower Brittany by Dr. Morvan. It is worth remark that not a single record comes from Derbyshire, and that such districts as are known to produce occasional examples of sporadic cretinism do not figure in any decisive manner in these returns.

SYMPTOMS.

BULK AND WEIGHT. An increase in bulk and weight is very constant.

PART OF BODY IN WHICH ŒDEMA WAS FIRST OBSERVED. The whole body is swollen, but, as might be expected, the head and face alone, or in association with other parts, are the most early recognised seats of swelling. The lower extremities seem to be more frequently the primary seat of swelling than the upper.

PHYSIOGNOMY. The physiognomy is characteristic, and may be described as "cretinoid," "mask-like," "placid," "heavy."

FACE. The features are broad, puffy and coarse. The eyelids are always the seat of transparent swelling, and the eyebrows are generally raised in order to

help to sustain the upper lid. The nostrils are swollen and broadened; the lower lip thickened, everted and livid; the mouth widened transversely. Over the cheeks and nose there is a well-defined red patch, in strong contrast with the pallid, porcelain-like orbital area.

The skin is dry and scaly, and there is usually marked absence of any tendency to perspiration and of sebaceous secretion.

SUPRA-CLAVICULAR REGIONS. In most cases there is fulness in the supra-clavicular regions, probably of complex origin; fatty, connective, or perhaps venous, according to some observers.

VULVA. The vulva, in the majority of cases in which it was noted, is described as swollen, dry and scaly.

EXTREMITIES. As regards the extremities, the hands are almost uniformly affected, being broad, clumsy-looking, "spade-like." The fingers are swollen, and moved with difficulty. The feet are broadened transversely, and, indeed, affected like the hands.

The extremities are cold, often purple or livid, and the skin dry, scaly, branny or desquamating. Warty growths and moles are not infrequent on the body and limbs, as well as on the face.

NAILS. The nails are apt to suffer, becoming stunted or brittle.

HAIR. The hair of the dry, scurfy scalp, in nearly all cases, is dry, ragged, and brittle, presenting a very characteristic appearance. These conditions usually go on to decided baldness. Similar affections are observed elsewhere, particularly in the eyebrows and eyelashes.

STATE OF THYROID, PAST AND PRESENT. The size and consistence of the thyroid gland are often difficult of determination in consequence of the fulness of the neck, so common in myxœdema. Nevertheless, in a considerable number of cases a distinct diminution in the size of the gland can be determined by careful observation.

In fifty-nine cases out of the 109 analysed in our tables, the condition is described as "uncertain" in twenty-three. It may be taken that, at least, there was no enlargement in these cases. In twenty-two, the gland is recorded to have been atrophied or reduced in size, and in three of these previous enlargement is mentioned. The gland is recorded in four cases to have been enlarged, and in one hard, as though calcareous.

TEMPERATURE. The temperature in myxœdema is almost always subnormal, although it may now and then rise to the normal standard, or even a degree or two higher. Even in such cases the average temperature over a long period will almost invariably be found subnormal. In not a few, the occurrence of normal temperature was associated with conditions such as phthisis, which would have in ordinary persons produced a rise of temperature above the normal. In a word, a temperature of about 98·6° in myxœdema may be generally taken to indicate pyrexia.

PRESENCE OF WATERY DROPSY. Œdema in slight degree is not uncommonly observed from time to time in the extremities, more especially about the ankles; but the existence of persistent watery dropsy is certainly accidental and often transitory. It may be noted that the face and trunk may be thus affected, and that ascites is recorded in the tables in only one case.

SENSATION. As a rule, cutaneous sensation suffers no loss or perversion, and there is usually no marked alteration in the recognition of heat and cold. Retardation of sensation is, however, observed in about half the number of cases in which this symptom has been dealt with. In a certain number the delay has been remarkable. But there arises here the difficulty that expression is slow, and that the note of reception of sensation may have been deferred by the hebetude of the

patient. In several cases which have been carefully examined, patients who were fully convinced that cold weather aggravated all their symptoms were far from being conscious of the existence at the moment of cold air impinging on their bodies. The skin appears to have been dull in its sensation, and to have failed to be affected by a low temperature which exercised a marked depressing influence on the system at large.

SUBJECTIVE SENSATIONS. Abnormal subjective sensations are common. They are referred both to tactile and special sensation, and it may be remarked that, in many cases, several subjective sensations co-exist. Most frequently there is coldness, very often described as the trickling of cold water on the skin. In addition to this are, frontal headache, rheumatoid pains, disagreeable smells and tastes, pricking and tingling sensations, partial numbness, noises in the ears, vertigo and tinnitus, and pains and heat at the top of the head.

OCCIPITAL HEADACHE. Occipital headache, of varying intensity, is present in a considerable proportion, its existence being noted in about one fifth of the cases.

PARALYSIS. Actual paralysis probably does not occur in myxœdema, except as an accident.

PARESIS. Paresis, especially of the limbs and muscles of the neck, is very common. In many patients the head falls forwards, so that the chin rests on the sternum, assuming exactly the same attitude as is commonly observed in cretins.

RETARDATION. Slowness of movement is very characteristic of the disease, and is rarely absent. This is especially evident in the gait.

INCO-ORDINATION. Inco-ordination, varying from mere awkwardness to actual staggering, is also noticed in many instances.

From want of adjustment of the flexors and extensors falls occasionally ensue, leading to

injuries, such as rupture of tendons and fracture of the patella.

CONTRACTURES. Permanent contractures of the extremities are present in myxœdema as a rare condition.

SUPERFICIAL REFLEXES. In a few instances the superficial reflexes are diminished, and in fewer still they are absent.

DEEP REFLEXES. The deep reflexes are usually normal, but sometimes they are slightly diminished or delayed, and in very exceptional cases absent. They are noted as probably exaggerated in six out of the forty-five cases in which the reactions were observed.

CONVULSIONS. Convulsions occur but rarely.

INTELLECTUAL CHANGES. Of the intellectual changes, slowness in apprehension, thought, and action is most constant, its absence being noted in three cases only.

SLOWNESS.

ABNORMAL PERSISTENCE. Abnormal persistence in thought and action is recorded in about one case in four.

IMPERFECTION OF MENTAL PROCESSES. In a rather larger proportion there is more or less imperfection of mental processes, the defect being, as noted before, one of retardation or sluggishness.

WRITING. Writing is sometimes slow, sometimes imperfect, conditions which may in large measure be attributed to the state of the hands. In the case of educated persons the handwriting is usually good, and the length of letters, in all respects well indited, is remarkable.

TEMPERAMENT. Irritability is a marked feature, though in exceptional instances the reverse is stated. In some cases placidity alternates with occasional outbursts of fretfulness or irritability.

SLEEP. In a large proportion sleep is noted as good, but in many of these there is excessive somnolence, especially in the daytime. In about one third of the cases wakefulness is recorded, and sleep is often disturbed by horrible dreams and sensations. It may be noted that drowsiness during the day is

very common in myxœdema in both good and bad sleepers.

DELUSIONS AND HALLUCINATIONS. Delusions and hallucinations occur in nearly half the cases, mainly where the disease is advanced. Insanity, as a complication, is noted in about the same proportion as delusions and hallucinations. It takes the form of acute or of chronic mania, dementia or melancholia, with a marked predominance of suspicion and self-accusation.

INSANITY.

AGORAPHOBIA. Agoraphobia is present in a smaller proportion than the mental changes previously mentioned. In many cases its mere existence is noted, but in a few, details are given, which show that this condition was undoubtedly present in a marked degree.

MEMORY. Memory is usually impaired from an early period of the disease, especially in respect of recent events. It is recorded as deficient in forty-six out of seventy-one cases.

CHANGES IN SPEECH. It is evident from the tabulated returns that changes in speech are very constant. In four cases only out of 104 replies is no alteration noted, and in two of these four there is a history of slow and drawling speech in the initial stages. Slowness is the most marked feature, though in many cases articulation is described as either "deliberate," "monotonous," "slurring," "hoarse," "nasal," thick," or "hesitating."

EYES AND VISION. Various returns have been made under the head of "eyes and vision." In more than a half no abnormality exists. Most of the defects recorded are clearly accidental. In a small proportion two conditions are noted, which may probably be looked upon as belonging to the disease: (1) general diminution of acuteness of vision (2) watering of the eyes. It may be mentioned here that exophthalmos has been observed once or twice in the early periods of myxœdema.

HEARING. Hearing is impaired in more than a half, and in a considerable number the defect has been unilateral. As in the case of vision, it is probable that in some the impairment of hearing was simply coincident. Nevertheless, deafness to a varying extent must be looked upon as a condition proper to myxœdema, and not merely an accident.

SMELL. The sense of smell is not infrequently defective. In a few cases a profuse watery nasal discharge is observed. In one instance perversion is noted.

TASTE. Taste is more often impaired than smell. In one case total loss is recorded. Retardation occurs in isolated cases only; but perverted subjective sensations are common.

Circulatory system.

BLOOD. No characteristic changes are known to exist in the blood, although it must be observed that in a few cases the coloured corpuscles or the hæmoglobin are diminished.

HEART. The heart is usually normal, excepting where renal disease has supervened. In a certain proportion the sounds are weak, and in a still smaller number accentuation and reduplication are recorded, here again in relation with late renal disease.

ARTERIES. The clinical record gives few instances in which the arteries are stated to have been atheromatous or thickened, and the pathological record indicates that arterial changes do not exist to any unusual degree.

PULSE. The pulse is usually weak, soft and slow. In only five cases is high tension recorded.

VEINS. The veins are dilated or congested in exceptional cases.

CAPILLARIES. The capillaries, on the contrary, are nearly always dilated on the face.

HÆMORRHAGES. Hæmorrhages have already been noticed as occasional antecedents of myxœdema; but they not infrequently take place from various parts, such as the throat, gums, nose, and uterus, when

the disease is fully established. Under this heading there may be mentioned two rare conditions; an unusual tendency to cutaneous ecchymoses, and retardation in the process of healing wounds.

Respiratory system. Respiratory troubles occur in no significant proportion, though it must be observed that death occasionally ensues from them.

Digestive system.

DEGLUTITION. Difficulty in deglutition is not uncommon, though often of the slightest description.

TEETH. The teeth usually suffer in their nutrition, and break off, fall, or become carious.

GUMS. The gums are often swollen, spongy and bleeding, and occasionally receding.

TONGUE, UVULA, AND SOFT PALATE The tongue, uvula, and soft palate are, as a rule, swollen.

DEFÆCATION. The bowels are usually constipated, although occasional purging is not uncommon. Prolapsus ani has been noted in two cases.

LYMPH GLANDS. The lymph glands are, in exceptional cases, enlarged, the condition, however, being probably accidental.

URINE. As regards the urine it may be noted that the specific gravity is very commonly subnormal, that albumen absent in the early stages is not uncommonly present in the later, and that the amount of urea excreted is almost always diminished. Frequency of micturition and, occasionally, incontinence are described.

Sexual system. No obvious alteration occurs in the sexual system.

CRISES. In a few instances crises, such as perspirations, diarrhœa, and vertiginous attacks, are noted.

COMPLICATIONS. Diseases complicating myxœdema have already been noticed. It is probable, however, that none of these occur in any significant proportion.

PROGRESS AND DURATION OF THE DISEASE. The progress of the disease is generally slow. Many patients, whose history shows they have

already suffered from the disease, have remained for ten years or more under subsequent observation. In many of such cases periods of improvement have been observed, sometimes so marked as to suggest that the disease had been arrested. But actual recovery is noted in only one instance, and the survey of cases shows that myxœdema tends to shorten life.

MODE OF DYING. In the majority of cases death results from intercurrent and perhaps consequent maladies, such as pulmonary and renal disease, or from accidental complications. In a certain number of cases death appears to be the direct result of myxœdema; intense anæmia, and a variety of nervous symptoms, such as maniacal excitement, coma, &c., preceding the fatal event.

TREATMENT.

In treatment, the use of tonics, particularly of iron, quinine and hypophosphites (meeting the obvious debility belonging to the disease) has been adopted with a certain amount of temporary success. Having regard to the defective action of the skin, jaborandi and pilocarpin have in many cases been administered, and, when administered over long periods, have appeared to exercise much beneficial influence.

Nitro-glycerine has been used in a very limited number of cases with fairly good result. Anti-syphilitic remedies do not appear to have affected in any marked degree the course of the disease.

An important element in treatment is the maintenance of warmth in the surrounding atmosphere; and the regular removal of patients during the winter to southern climates has appeared to mitigate their sufferings and to prolong their tenure of life.

DESCRIPTION OF PLATE I.

Fig. 1.—Shows the appearance of the patient at the age of twenty-one, before the beginning of the myxœdematous swelling.

Fig. 2.—Photograph taken seven years afterwards.

Fig. 3.—Photograph taken about four years later.

(Figs. 1 and 2 are reproduced, by permission, from Dr. Ord's original contribution in the 'Medico-Chirurgical Transactions,' vol. lxi.)

The case is No. 96 in the Clinical Tables.

Clinical Society's Report on Myxœdema, Plate I

Fig. 1.

Fig. 2.

Fig. 3.

From Photographs.

Danielsson & Co, lith.

DESCRIPTION OF PLATE II.

FIG. 1.—Shows the appearance of a male patient before the onset of the disease.

FIG. 2.—Exhibits the same patient several years afterwards, when the myxœdematous condition was fully developed.

A patient of Dr. Ord's. No. 87 in the Clinical Tables.

Clinical Society's Report on Myxœdema, Plate II.

Fig 1.

Fig 2.

From Photographs.

Danielsson & Co lith

DESCRIPTION OF PLATE III.

Sporadic Cretin.

The subject of this illustration was a female, aged 12 years and 7 months, under the care of Dr. Stephen Mackenzie, in the London Hospital.

Paternal grandfather born in Connaught, Ireland; maternal grandfather born in Newcastle-on-Tyne; both drunkards. Both grandmothers and both parents born in London, and very temperate. Parents always had good health. Mother has had nine children and six miscarriages. The living children are all quite healthy. The mother had a great fright seven months before the birth of this child. The child has always lived in London.

The child is very small for her age; the head is large, and the abdomen prominent. There is right lateral curvature of the spine in the dorsal region. The face is large and flat, the lips thick; the mouth is usually open, but the tongue does not protrude. The nose is broad and very flat. The vertex is much flattened; the anterior fontanelle still patent, one inch in each direction; the frontal suture persistent. The skin is thick, yellowish, pliable, dry to the touch, and smooth, except on hands, where it is wrinkled. No thyroid gland can be felt. There is a soft puffy swelling in each supra-clavicular fossa. The teeth were cut in fourth year; they belong to the milk set, are yellow and much worn down, and some are decayed.

The child when first seen was very lacking in intelligence, spending most of the day sitting in a chair doing nothing, and slept very much. She began to talk when eight years old, and when admitted could only say simple words, such as "mamma," "papa," "Georgie," &c., in a very childish voice. She began to walk when five, and can only get along with a very uncertain gait. Did not exercise complete control over the bladder. Her temper was said to be bad. The child remained in the hospital four months, during which time her mental condition improved considerably, and proved very tractable.

The following comparative measurements by Mr. E. Curwen are of interest and value:

Measurements of Patient.		*Average of Measurements of Girls of 12 years.*		
	Inches.	Inches.		
Occipito-bregmatic	6·13	6·04.	Number of observations —	34
Occipito-frontal	7·13	6·72.	„ „	34
Occipito-nasal	6·87	6·34.	„ „	34
Occipito-mental	7	6·7.	„ „	34
Mento-bregmatic	7	7·53.	„ „	34
Inter-parietal	5·75	5·47.	„ „	34
Inter-external angular processes	4	4·04.	„ „	24
Circumf. at level of eyebrows	21·5	20·38.	„ „	24
„ of neck and face at chin level	16	14·28.	„ „	22
Thorax at nipple level	23·5	24·16.	„ „	11
Abdomen at umbilicus	22	20·8.	„ „	10
Height	34	54·03.	„ „	24

Clinical Society's Report on Myxœdema, Plate III.

From Photographs. Fig.1 Fig.2. *Danielsson & Co, lith.*

SECTION III.

PATHOLOGICAL REPORT.

The Sub-Committee for the examination of the morbid anatomy of the disease decided at its first meeting:

(*a*) To summarise the naked-eye appearances found in such fatal cases as were seen by the Sub-Committee, or reported by others.

(*b*) To examine microscopically the tissues from as many subjects as should be available. Thirty-one fatal cases have come under the notice of the Sub-Committee, but in several of these no autopsy was made. The tissues and organs have been examined microscopically in 20 cases, but some cases have been examined much more completely than others.

Naked-eye appearances.

The naked-eye morbid appearances have been analysed by the Sub-Committee in 15 cases. Some changes were obviously unimportant and accidental, but some demand special and detailed notice.

Fat.

With two exceptions the subcutaneous fat was abundant, and often the fat elsewhere was markedly in excess. In one instance the subcutaneous tissue was described as "gelatinous," and in one as "œdematous," but no unusual physical appearances were noted in the remainder. In one case the body was emaciated, and in another there was no excess

of fat, although there had been a general swelling at one period of the disease.

SUPRA-CLAVICULAR REGIONS. In only 2 cases would it appear that special note had been made of the supra-clavicular regions, and in these no excess of fat was observed.

ANASARCA AND SEROUS EFFUSIONS. Anasarca to a slight degree was not uncommon, though in no instance was it excessive. On the other hand, passive effusions into the serous cavities, sometimes to a considerable amount, were frequently noted. In a few cases there was marked excess of the subarachnoid fluid.

THYROID GLAND. The thyroid gland was in every case reduced in size, and is described variously as pale, yellowish white, or buff-coloured, firm, tough and indurated, fibrous and structureless. In two or three cases the affection was more advanced in one lobe than in the other.

KIDNEYS. In about one third of the cases the kidneys were described as normal. In the remainder there was more or less interstitial change, in some not greater than might be anticipated in persons of adult or advanced life. In one case, described by Dr. Ord ('Clin. Soc. Trans.,' vol. xiii), "the kidneys were of average size, and of extraordinary firmness, giving to the touch a sensation like that of india rubber. The surface was smooth, the capsules not adherent."

HEART. The left ventricle of the heart was hypertrophied in a third of the cases, and in all these the kidneys were granular. In one instance the muscular substance of the heart was fatty, and in one "gelatinous."

ARTERIES. In more than half the cases there was atheroma of the large arteries, but in only rare instances was the condition advanced. Arterial degeneration, indeed, does not appear to exist to any unusual extent, at any rate in the larger vessels.

VARIOUS. In a few instances there was tubercular disease

of organs, and in still fewer cases cirrhosis of the liver was noted.

Microscopical examination.

SKIN (8).*

In 2 the sections were found normal. In one of these cases (Atkinson's, not published in the tables) the disease was in an early stage (compare description of thyroid). Very marked alterations were seen in the majority of cases, and the changes were very similar, whatever the region of the body examined. In the coiled tubes of the sweat-glands the epithelium becomes swollen, then nuclear proliferation takes place, and the lumen of the tubes becomes obliterated. In the later stages a nucleated fibrous growth is seen in the tissue outside the tubes. The change in the sebaceous glands resembles very closely that in the sudoriparous glands, and is probably identical with it. The sebaceous glands are represented by irregular masses of nuclei, and sometimes there is cellular accumulation in the tissues outside them. These cellular accumulations in some cases seem to undergo partial or complete absorption. Around the hair-follicles a nuclear growth is apt to develop, and external to this growth an abundant nucleated fibrous tissue is sometimes seen.

In one case (39 in the tables) there appeared to be thickening of the perineurium of the nerve-tubes in the subcutaneous tissue, and in the same case the bundles of fibrous tissue in the corium were widely separated, an appearance which might be due to œdema. The same open-textured condition was seen in a section of lower eyelid from another case.

In one or two cases sections of the lower lip were examined, but nothing abnormal was detected, except in one instance an abundance of fat in the submucosa.

* The number in brackets indicates the number of cases in which the organ or tissue was examined.

Uvula and soft palate (5). The uvula in one case presented an appearance which might be termed œdematous, but in the remaining 4 cases both it and the soft palate were healthy.

Submaxillary gland (2). The submaxillary gland was quite normal in one case. In the other very marked changes were found. The description is given below in connection with the thyroid gland (case of Dr. Hale White).

Kidneys (12). The kidneys often exhibited ordinary interstitial change, of varying degree. In a half or more of the cases nothing abnormal was discovered.

Adrenals (5). Early tubercle was found in the cortical and medullary parts in one instance (No. 42 in the tables). In the remaining 4 cases no lesion was present.

Liver (15). In 7 cases the liver was found to present pathological change, and 3 of these had been described by Dr. Ord. Of these 3 cases, one showed two thick fibrous tracts in the section examined by the Sub-Committee, but the liver-cells themselves were healthy. In the second (95 in the tables) there was a little thickening about the portal vessels, but the liver was otherwise healthy. In the third an excess of pigment was seen in the hepatic cells, and some of the cells were atrophied; in addition, the fibrous septa were swollen and hyaline looking.

Of the remaining 4 cases, early cirrhosis was found in 2, fatty change with early tubercle in one, and granular pigment in the hepatic cells in one.

Heart (9). In only 3 cases was there any change of a pathological nature. The most marked alteration was seen in a section taken from one of Dr. Ord's cases (95 in the tables). The muscle-nuclei were very abundant, and many of them were voluminous. In addition, there were seen, copiously scattered between the fibres themselves, numerous nuclei,

some round and some oval. In Case 42 in the tables an increase in the interstitial nuclei was seen, and this may be looked upon as an early instance of interstitial myocarditis, of which Dr. Ord's case was an undoubted example. In the third case there was simple pigmentary excess in the muscular fibres.

Lungs (7). In 2 cases there was early catarrhal pneumonia and emphysema, the bronchial septa being thickened in one, and the vesicular walls slightly thickened in the other. In the third case there were miliary tubercles and anthracosis.

Brain (5). In a section taken from a frontal lobe, a cellular accumulation was present around the vessels, which was probably tubercular. The case is 42 in the tables, and the patient died from general tuberculosis.

The cerebellum was examined twice, the pons twice, and the medulla oblongata four times, but nothing abnormal was discovered. Other parts of the intracranial contents, including the pituitary body, were also examined in solitary instances, but the Sub-Committee failed to discover any pathological change.

Spinal cord (4). The cervical and lumbar regions in one case (Dr. Ord's, No. 95) were examined, but with the exception of some thickening of the septa, especially in the posterior columns, the sections were healthy. In another case of Dr. Ord's there was some thickening of the pia mater.

Sympathetic ganglia (10). In 5 cases fibrosis was present in the superior cervical ganglion, and in 3 others there was probable interstitial change.

Various. The lymphatic glands, tongue, spleen, pancreas, uterus, intestines, and aorta have been occasionally examined. Early tubercular infiltration was found in the small and large intestine in one case, and some atheroma of the aorta in another case. With

these exceptions, the parts above mentioned were found healthy.

Thyroid gland (13). In every instance the thyroid gland exhibited striking and uniform disease, exactly in accord with Dr. Ord's original case.* In view of the importance of this observation, as it now appears, it is worth while to transcribe the record of each examination made by the Sub-Committee.

Case 1 (Johnstone, Dr. Ord).—Nearly the whole thyroid is converted into delicate fibrous tissue, which is here and there infiltrated with clumps of cells, which evidently replace the gland vesicles. The adventitia of the arteries is swollen. This is Dr. Ord's original case, and the description here given agrees with that stated in the paper. See footnote.

Case 2 (Collings, Dr. Ord).—The thyroid is in great part converted into pure fibre containing scattered masses of round-cells. In several parts these nuclei are invading and infiltrating the vesicles, which appear in other respects fairly healthy. There are other lobules which, while themselves almost natural, yet exhibit in an earlier stage the same change, the walls of the vesicles showing a round-celled growth.

From this specimen it is inferred that the disease in the gland commences as a small cell-infiltration of the walls of the vesicles, that the next stage is one of gradual disappearance of the vesicles with substitution of nuclei, and that the last is the formation of fibrous tissue.

Case 3 (Lockwood, Dr. Ord).—Outlines of the lobules seen in parts as small islets of round-cells.

* "In the thyroid gland the alveoli are compressed, and mostly annihilated by a growth of the kind which can here be seen in great perfection around the vessels" ('Medico-Chirurgical Transactions,' vol. lxi, p. 67).

THYROID GLAND (*continued*). Much fibroid tissue replacing the proper thyroid structure.

CASE 4 (McClean, Dr. Goodhart).—The thyroid shows complete fibrous change. The glandular structure is altogether absent. The walls of the blood-vessels are much thickened, and here and there are groups of small stained cells, which appear to be remnants of vesicles.

CASE 5 (Arthur A—, Dr. Goodhart).—The thyroid structure is unrecognisable, the gland substance being entirely replaced by a wavy fibrous tissue. In one or two places in the middle of this are clusters of nuclei, no doubt relics of the original vesicular tissue in a diseased state.

CASE 6 (Dr. Hale White).—Thyroid. Vesicles filled with large round-cells apparently the nuclei of the epithelium. Much interstitial fibrous growth. Hyaline thickening around the vessels.

This specimen differs from the previous ones in the presence of epithelial accumulation in the vesicles.

To this may be added the following description of the examination of the submaxillary gland of the same patient:—Under a low power there is a confused appearance of gland acini, the ducts remaining distinct. The fibrous stroma is generally thick, while tracks of fibrous tissue appear in places. Under a higher power the morbid changes are found to be epithelial accumulation in the gland acini, interstitial fibrous invasion, and cell-infiltration; the latter is much less than that seen in the thyroid.

CASE 7 (S. K—, Mr. Hopkins).—Very advanced fibrous change in the thyroid with scanty islands of round-cell infiltration in which the outlines of the vesicles are here and there preserved. One large cyst filled with colloid material, around which there is a similar round-celled infiltration to that seen in previous cases.

THYROID GLAND (*continued*).

CASE 8 (Dr. Atkinson).—Much fibrous change in the thyroid, with groups of richer cell-infiltration than in any of the preceding specimens, and from which it may be inferred that the disease is in an earlier and more active stage. The submaxillary gland in this case was healthy.

CASE 9 (Mr. Barling).—The sections examined had been cut from two separate parts of the gland. The one fairly healthy in places, in others much small cell-infiltration. In the other a similar small cell-infiltration with fibrosis, atrophy, and compression of the vesicles.

CASE 10 (Dr. E. White).—The thyroid in a state of extreme fibrosis with clusters of nuclei and thickened vessels as in other cases.

Mr. Victor Horsley has forwarded to the Sub-Committee a report on the histological appearances seen in the thyroid gland in two cases formerly under the care of Mr. Lunn, of the Marylebone Infirmary, and in a case of Dr. Savage, of Bethlem Hospital.

CASE 11. Edward D—.—(*a*) *Stroma*, including capsule, greatly increased; overgrowth of fibrous elements as well as corpuscles. Everywhere it is greatly infiltrated with leucocytes. In many places these are collected into masses, but for the most part they are distributed around the remnants of the lobules of the gland, penetrating between the relics of the alveoli, and apparently overwhelming these latter. In some instances only a few scattered and enlarged epithelial cells, buried in leucocytes, indicate the former existence of a glandular lobule.

(*b*) *Gland tissue.*—The alveoli nowhere contain mucinogenous substance. Very rarely is a little débris (? albuminous) seen here and there. Atrophic. The epithelium is "proliferating" for the most part. The individual corpuscles are much overgrown, penetrate into the lumen by pointed

THYROID GLAND (*continued*). processes, and in many instances completely fill the cavity of the alveolus by their bulk (possibly also the alveolus is compressed by the leucocytes, and certain it is that the alveoli are very much diminished in size). Very rarely is a small alveolus seen with the characteristic cubical epithelium.

(*c*) *Vessels.*—(1) Blood, all notably congested. (2) Lymphatic, empty.

CASE 12. George M— (56 in Tables).—(*a*) *Stroma* practically composes the whole gland. It is exceedingly densely fibrous. Very few corpuscles are to be seen.

(*b*) *Gland tissue.*—Here and there in the stroma, at distances from ·5 to 1 cm., are to be seen minute nodules about 1 to 2 mm. in diameter, which stain darkly. On microscopic examination these are found to be composed of leucocytes, among which are a few degenerated and shrivelled epithelial corpuscles.

(*c*) *Vessels.*—(1) Blood, partly filled here and there, majority empty. (2) Lymphatic, empty.

CASE 13. S. D—.—(*a*) *Stroma* everywhere represented as dense fibrous tissue, in which were scattered at distances varying from a few (3 to 5) mm. to 1 cm. minute foci or collections of leucocytes.

(*b*) *Gland tissue.*—The sole remains of the thyroid gland tissue were a very few epithelial corpuscles, which were shrunken and degenerated, buried in the collections of leucocytes seen in the stroma.

(*c*) *Vessels.*—The stroma was fairly vascular, the walls of the vessels being normal.

Remarks.—From the above account it would appear that the only constant pathological change exists in the thyroid gland. The lesion, moreover, was in every instance of the same nature. The only case known to us which is in any way an exception is the one recorded by Dr. Gulliver in the 'Transactions of the Pathological Society of London,' vol.

xxxvii, p. 511. The case is one of carcinoma of the thyroid gland in myxœdema. It is not expressly stated in the report that the thyroid tissue was anywhere in a state of atrophy, but the argument of the author is that carcinoma "invades by preference atrophic or functionally inert organs."

The nature of the lesion of the thyroid gland has already been described in each case examined by the Sub-Committee; but a brief general account of the pathological process may be of service. The morbid condition seems to begin as a small-celled infiltration of the walls of the vesicles, and this is accompanied or soon followed by epithelial proliferation in the vesicles themselves.

In a more advanced stage the gland becomes converted into a delicate fibrous tissue in which clumps of small round-cells, clearly the remains of the vesicles, are scattered. In the last stage the gland structure is replaced by fibrous tissue, in which small islets of round-cells are sparsely placed.

It may be observed here that in most of the fatal cases the thyroid gland exhibited very advanced and general structural alteration, but that in a few the pathological change was comparatively in an early stage. In one indeed (Mr. Barling's), the glandular elements in some places showed very little departure from the normal state; but in other sections the characteristic morbid change was very obvious.* It would appear therefore that death may ensue before the affection of the thyroid gland becomes advanced, and also before the entire gland becomes invaded.

The various changes which have already been mentioned as occurring in the organs and tissues have not been found with sufficient constancy to lead the Sub-Committee to suppose that they could have any causal relation with the disease; but some have been met with so often that they probably occur as secondary changes at some stage of the affection in the great majority, if not in all cases. As regards the skin, we have found very frequently the nuclear hyperplasia and the deve-

* The patient was a woman of seventy-six, under the care of Dr. Suckling. Death resulted from asthenia, not from any accidental complication (see 'Lancet,' 1885, vol. i, p. 889, and 1886, vol. ii, p. 970).

lopment of connective tissue which Dr. Ord describes in his original paper, and these changes occur mainly in the neighbourhood of the sudoriparous and sebaceous glands, and around the hair-follicles. In a few instances the Sub-Committee has noticed an unusual interval between the bundles of fibrous tissue in the corium. This open-textured condition is, however, quite exceptional, and it differs in no respect from what is seen in ordinary œdema.

It may be mentioned here that, unfortunately, we had very few complete sections of the lower eyelid, and hence we are not in a position to offer a satisfactory explanation of the swelling so often seen in this situation during life. In one case, however, the same open-textured appearance, to which allusion has just been made, was distinctly present.

The increase in bulk so frequent in myxœdema is due to an overgrowth of the subcutaneous fat, as is clearly shown by the results of post-mortem examination. The loss of hair, the absence or diminution of perspiration, and of the secretion of the sebaceous glands, may reasonably be ascribed to the anatomical lesions which are so often seen in the skin.

Interstitial changes in the internal organs have not infrequently been found, as will appear from the detailed account already given. These changes are most common in the kidney, and they presented the ordinary features of interstitial nephritis, though very often of no great intensity. The Sub-Committee, however, is of opinion that such alterations, so frequently found as they are in persons of adult or advanced life dying from various causes, cannot be considered peculiar to myxœdema.

The liver was healthy in rather more than half the cases, and when alterations were present they were usually either partial or slight. Indeed, in two or three instances there is still some doubt whether the appearances were not within the limits of the normal state.

In two cases out of the nine examined the heart presented changes of the same nature, one exhibiting an early stage, and one a comparatively advanced stage of interstitial myocarditis. It may here be observed that in neither of them was

there any history of syphilis. In the remaining two thirds of the cases the organ was healthy.

The changes in the sympathetic, though frequent, are not constant, and for this reason, and also on the ground that the superior cervical ganglion was usually the only part examined, the Sub-Committee feel that they are not justified in ascribing to such changes any importance from an etiological point of view.

The thickening of the adventitia of the arterioles, originally described by Dr. Ord, has been very often seen by us, but in only one instance was there evidence of any overgrowth of the perineurium of the cutaneous nerves.

The conclusions of the Sub-Committee are as follows:

(1) That myxœdema is dependent on a destructive affection of the thyroid gland.

(2) That changes in the skin, mainly in and around the sebaceous and sudoriparous glands and in the neighbourhood of the hair-follicles, are frequent, and probably, in the later stages of the disease, constant. The morbid process in the skin is not passive or atrophic, but of an irritative character, resembling the inflammatory process.*

(3) That interstitial change does not occur in the organs as a generalised condition, though it occasionally is present to a varying degree in the sympathetic, the kidneys, the liver, the heart, and the submaxillary gland.

JOHN CAVAFY.
JAMES F. GOODHART.
W. B. HADDEN.

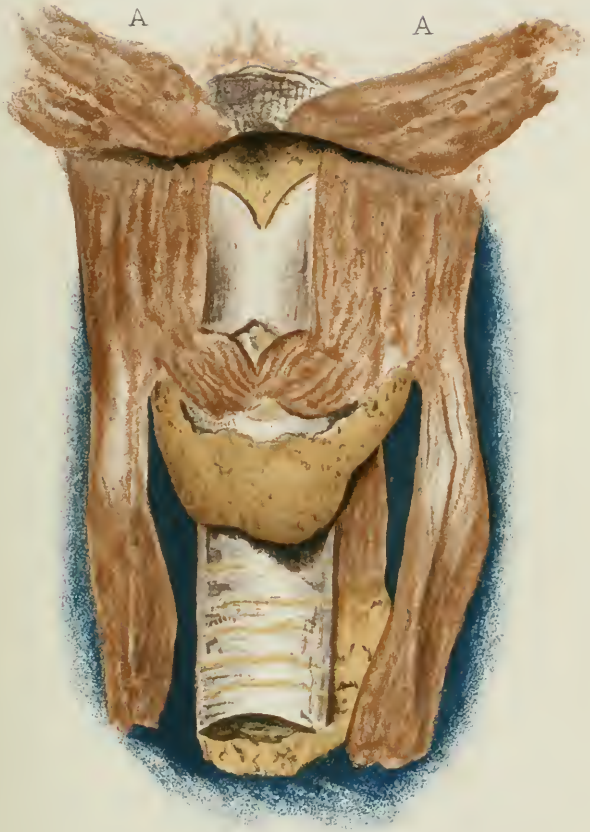
* This view was clearly expressed by Prof. Virchow in the *Berliner klinische Wochenschrift* on February 2nd, 1887.

DESCRIPTION OF PLATE IV.

(From a drawing by Mr. Jonathan Hutchinson, jun.)

The appearance of the thyroid body of a female patient, who died in the London Hospital in 1886, under the care of Dr. Stephen Mackenzie. The patient was fifty-two years of age at the time of her death. Her symptoms had extended over fourteen years, and she had passed into the atrophic stage.

The thyroid body was extremely wasted. The microscopical examination was made by Mr. Hutchinson, who reports: "Much of the gland tissue replaced by fibrous tissue, containing very few cells, and probably formed a considerable time. In the part examined there were no large vesicles, and although some still contained colloid matter, in many of them this appeared to be shrinking, and was often pitted by round-cells, possibly altered epithelium. There were many groups of evidently atrophied vesicles of various sizes, containing a few round-cells or irregular granular ones, some of which were found scattered in fibrous tissue, which was almost everywhere in excess. Fat was present in various parts of the sections. The vessels did not appear to be altered from the normal."



J. Hutchinson, Jr., del

Daniellsson & Co, lith.

DESCRIPTION OF PLATE V.

Photograph of base of tongue, larynx, and trachea, with atrophied thyroid gland, from a well-marked case of myxœdema (No. 13 in list on p. 43).

c.—Thyroid cartilage.

Thy.—Thyroid gland, greatly atrophied. The right lobe is dissected out, and shows the concave inner surface, which is closely applied to the trachea. The extreme pallor of the organ is well shown, as also the diminished size of the blood-vessels.

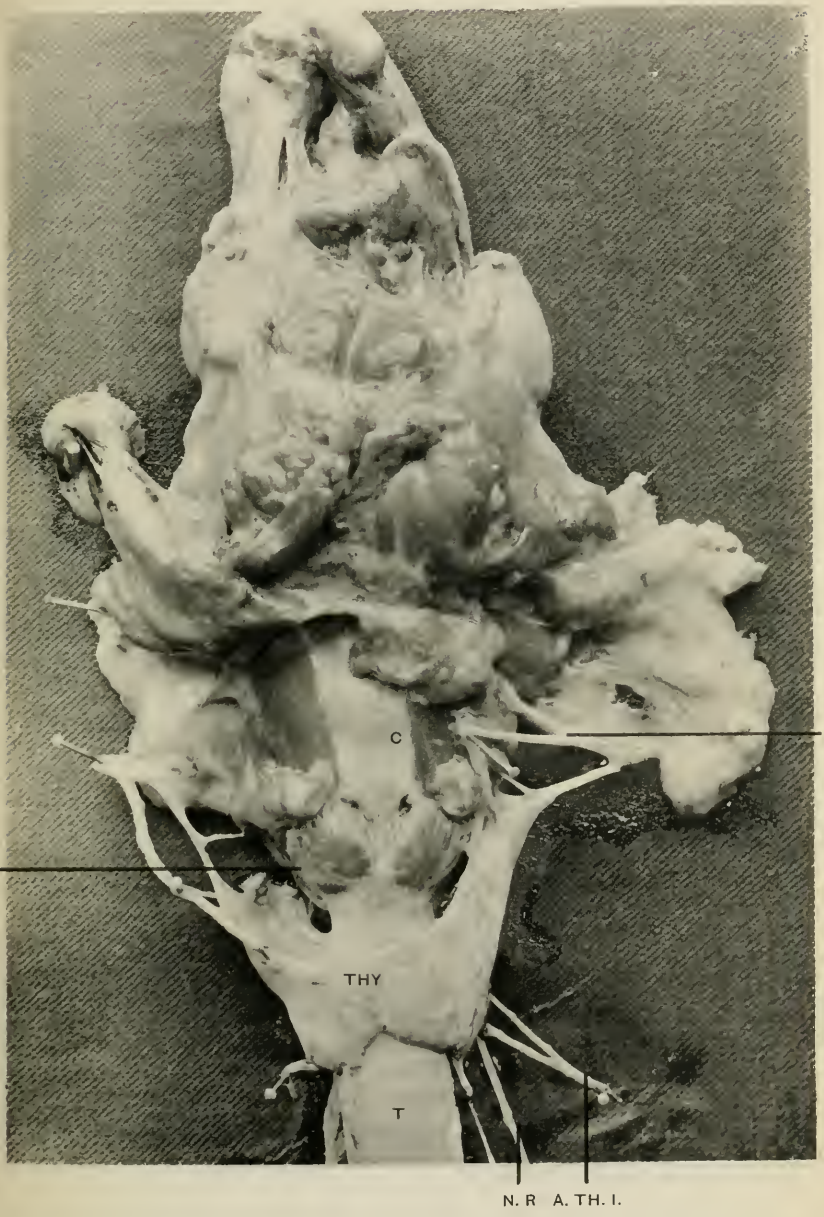
t.—Trachea normal.

nr.—Recurrent laryngeal nerve normal.

a.th.s., *a.th.i.*—Superior and inferior thyroid arteries.

m.c.th.—Crico-thyroid muscle.

The reference letters are printed in capitals on the plate.



Danielsson & Co., Photo Print.

DESCRIPTION OF PLATE VI.

Fig. 1.—Section of eyelid. Cutaneous surface, showing thickening of fibrous walls of hair-follicles, and irregular bulging of root sheath, either due to budding from its surface or constriction by surrounding fibrous tissue. Hairs in process of shedding. (× 80.)

Fig. 2.—Section of eyelid. Showing Meibomian gland and arterioles with thickened fibrous coat. (× 80.)

(Reproduced, by permission, from Dr. Ord's original contribution in the 'Medico-Chirurgical Transactions,' vol. lxi.)

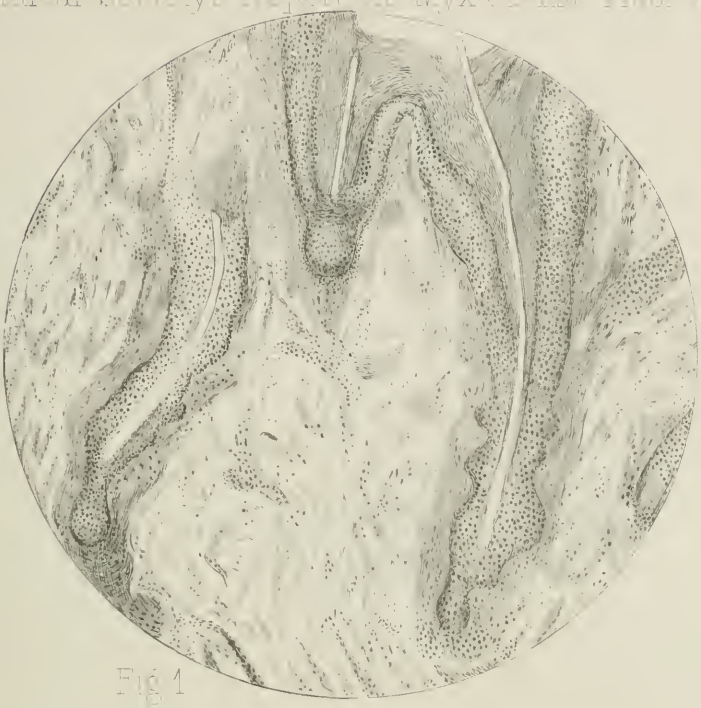


Fig 1

Fig 2

P Stewart del.

DESCRIPTION OF PLATE VII.

Fig. 1.—Section of thyroid gland showing almost complete replacement of its vesicular structure by connective tissue with cell-crowded patches. Fibrous coats of arterioles thickened (× 80). Late stage. (Reproduced, by permission, from Dr. Ord's original contribution in the 'Medico-Chirurgical Transactions,' vol. lxi.)

Fig. 2.—Section of thyroid gland showing round-celled infiltration, in parts obliterating the outlines of the vesicles (× a, Zeiss). Early stage. (Case of Mr. Hopkins, No. 43 in Clinical Tables.)

Fig. 3.—Part of fig. 2 more highly magnified. Invasion of walls of vesicles by round-cells. The epithelial cells are undergoing degeneration with nuclear proliferation.

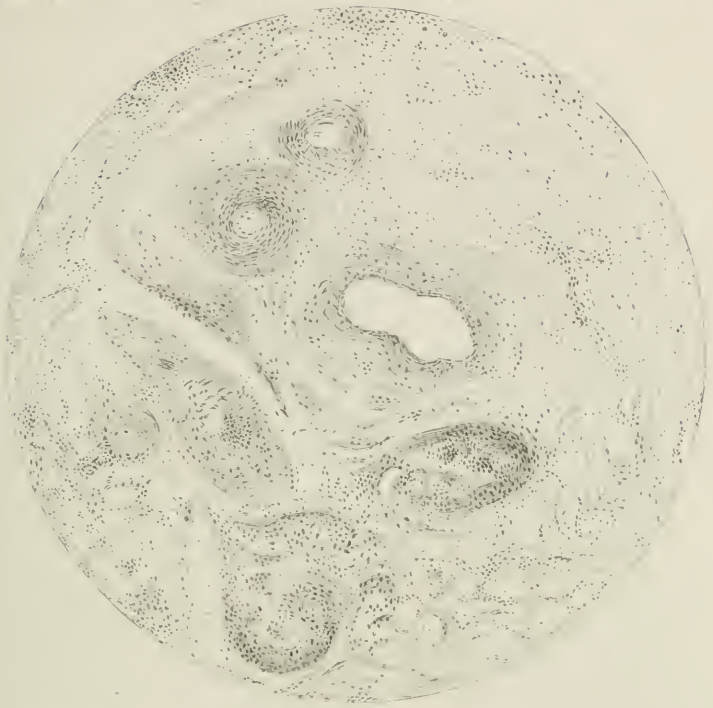


Fig 1

Fig 2

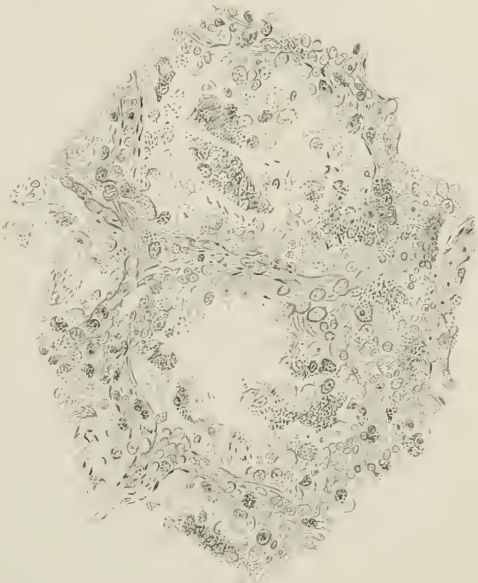


Fig 3

DESCRIPTION OF PLATE VIII.

Section of part of thyroid gland, Case No. 11 in list on p. 42.

The remnant of a lobule is seen undergoing atrophic changes. The epithelium (*e.*) is proliferating and at the same time atrophying, as seen specially at the margin of the lobule. The destruction is secondary to the invasion of the interstitial capsular tissue (*c.*), which is thickened by leucocytes (*l.*). The process is apparently one of contractile or atrophic cirrhosis.

Clinical Society's Report on Myxœdema, Plate VIII.

M.H. Lapidge, del.

Danielsson & Co. lith.

SECTION IV.

REPORT OF CHEMICAL INVESTIGATIONS OF THE TISSUES AND ORGANS FROM CASES OF MYXŒDEMA IN MEN AND ANIMALS.

The name Myxœdema was originally given to this disease on the grounds that one of its most pronounced symptoms was an œdematous condition, which was not the result of a watery dropsy but of a swelling of the subcutaneous and other connective tissues, due to an excess of a mucin-yielding intercellular substance. In the disease artificially produced in animals a similar condition was found to be present. This report deals with the chemical investigation of the tissues and organs from these cases. The analyses have been made by various observers, who have all adopted, with slight variations, the same method.

Method.—The tissue was first finely minced and weighed, and subjected to the action of methylated spirit for a few days; the spirit was then poured off and either lime-water or baryta-water (diluted five times with distilled water) added. After being allowed to stand in contact with the tissue some days, the lime- or baryta-water was filtered off, and the mucin in it precipitated by a slight excess of acetic acid. This precipitate, granular at first, became flocculent after standing a few hours; it was then collected on a filter which had been dried at 100° C., and weighed; then it was washed with water acidulated with acetic acid, distilled water, rectified spirit and

ether; then dried at 100° C. to constant weight, and weighed. From this the percentage of the mucin in the tissue was calculated. In some cases the tissue was not weighed in the fresh condition, but after it had been under spirit for some time. The use of the spirit was in some analyses omitted, as, for instance, in those by Dr. Stevenson. The object of using spirit is in the first place to preserve the tissue until it reaches the hands of the analyst, and in the second place to render albuminous substances insoluble in the alkali used to dissolve the mucin. It is not, however, absolutely necessary, because if any proteids enter into solution they are precipitated by the acetic acid, and are soluble in excess, which mucin is not. Moreover, in certain cases the use of methylated spirit has a distinct disadvantage, viz. in those which have been kept some months under spirit before an analysis was performed. The spirit does not render the mucin itself insoluble in the lime- or baryta-water, but it produces such hardening of the tissues that it renders it difficult for the lime- or baryta-water to thoroughly soak out all the mucin from the pieces. In cases in which fluids have been analysed for mucin, alcohol has always been used, and, indeed, seems to be absolutely essential; it precipitates both mucin and proteids; the latter are thus rendered insoluble in lime- or baryta-water, while the mucin enters into solution.

In some of the analyses the mucin was still further purified by redissolving the acetic acid precipitate in lime-water, and again precipitating it by acetic acid before weighing it.

This method can only be regarded as a comparative one, and not as giving the absolute quantity of mucin in the tissues. It was therefore necessary to make similar analyses of the normal tissues in order to compare the results obtained in cases of myxœdema with these.

It will be convenient to divide the report into two parts, the first of which deals with the analyses of human tissues and organs, and the second with those of lower animals.

Part I.

Mucin in normal human tissues.—The following analyses of the mucin in the skin were performed by Dr. Halliburton in the Physiological Laboratory, University College, London. The results may best be stated in the following tabular form:

Sex of patient.	Age of patient.	Cause of death.	Part from which the skin was taken.	Percentage of mucin present.
M.	Stillborn	—	Leg	0·96
M.	7 weeks	Pyæmia	Abdomen	1·02
F.	2 years	Syphilis	„	0·74
M.	6 „	Gangrene of lung	„	0·72
F.	9 „	Nephritis	„	0·39
M.	20 „	Tuberculosis	„	0·42
F.	40 „	Carcinoma	„	0·29
M.	53 „	—	„	0·11
M.	56 „	Aortic disease	„	0·64
M.	63 „	—	„	0·264
F.	67 „	Pneumonia	„	0·59

In addition to these a few analyses of other normal tissues have been made. These results may be arranged in the following table:

Case.	Tissue.	Percentage of mucin.	Analyst.
Bright's disease	Connective tissue from thigh (?)	0·5	Dr. Stevenson (Clin. Soc. Trans., xv, 94).
Case of accident	*a.* Connective tissue from thigh	0·5	Ditto.
	b. Tendo Achillis	0·77	
	c. Tendons of breast	Traces	
	d. Pericardial fat		
—	Heart tendons	Doubtful	Dr. Stevenson (unpublished).
Female (Bright's disease)	Tendo Achillis	0·539	Dr. Halliburton.
Male (septicæmia)	Tendo Achillis	0·298	
—	Parotid	Trace	

In all the foregoing cases the percentages refer to the organ as weighed in the fresh condition.

The following numbers represent the averages obtained in normal tissues :

	Percentage of mucin.
Skin (children)	0·766
Skin (adults)	0·385
Connective tissues	0·521
Parotid Heart tendons	Traces.

Mucin in myxœdematous tissues.—The first analyses were made by Dr. T. Cranstoun Charles in the case published by Dr. Ord in the ' Medico-Chirurgical Transactions,' vol. lxi. Dr. Charles states (p. 62) that the skin of the feet yielded fifty times more mucin than the skin of healthy people, or those suffering from ordinary œdema. In this case the patient was a female (H. J—) æt. 60, and death occurred after the disease had lasted ten years, the patient being still in the swollen condition.

The following are the analyses that have been made by Dr. Stevenson :

1. Male, æt. 46, under the care of Dr. Goodhart (' Clinical Society's Transactions,' vol. xv, p. 94). Duration of disease four years (?) ; death occurred when the patient was " very fat with probably no wasting."

The following were the tissues analysed :

Tissue.	Percentage of mucin.
a. Cardiac tendons	1·9
b. Pelvic cellular tissue and fat	Traces.
c. Thoracic cellular tissue and fat	0·4
d. Subcutaneous tissue from thigh *e.* Connective tissue of liver	Traces.

2. Female, æt. 62, under the care of Dr. Goodhart (not published). Death occurred in the wasted, not the swollen condition."

Dr. Stevenson's report was as follows : " Chemical analysis of various parts failed to indicate any excess of mucin ; only traces could be obtained."

3. Female (E. C—), æt. 57, under the care of Dr. Goodhart

(not published). A note made post mortem ran as follows: "Body enormously stout, but the subcutaneous fat healthy; eyelids a little œdematous."

Dr. Stevenson's report was as follows: "The brain and liver gave no indication of the presence of mucin; the kidney and the fatty tissues yielded unweighable quantities only; the skin contained a small quantity (0·012 per cent.); and the cardiac tendons alone gave a considerable amount (1·72 per cent.)."

The following are the analyses that have been made by Dr. Bernays:

1. Female (H. M. P—), æt. 56, under the care of Dr. Hopkins (No. 43 in tables). Duration of disease thirty-two years; "probably no wasting" at time of death.

The analytical results were as follows:

Tissue.	Percentage of mucin.
a. Skin of abdomen	0·38
b. Skin of back with some of the gelatinous subcutaneous tissue	0·30

2. Female (H. M—), æt. 58, under the care of Dr. Atkinson ('Proc. West London Med.-Chirurg. Society,' 1885). Duration of disease three years. Patient died in the swollen condition, much subcutaneous fat being found post mortem.

The analytical results were as follows:

Tissue.	Percentage of mucin.
a. Skin of abdomen with fatty tissue	0·81
b. Skin of abdomen without fatty tissue	0·36

3. Female (I. L—), æt. 41, under the care of Dr. Ord. Duration of disease sixteen years. "Much fat, possibly some wasting, as she died of phthisis."

The analytical results were as follows:

Tissue.	Percentage of mucin.
a. Mesenteric fat	0·18
b. Skin of abdomen	0·17
c. Spleen	2·21
d. Lung	0·72
e. Heart	1·91
f. Intestine	0·41
g. Liver	None.

It should be noted that in this case the organs were kept under spirit for a month before the analyses were made.

4. Female (H. H—), æt. 44, under the care of Dr. Ord. Duration of disease four years. Enormously fat at time of death.

The analytical results were as follows:

Tissue.	Percentage of mucin.
a. Heart	1·09
b. Lung	0·03
c. Liver	0·05
d. Spleen	0·03
e. Abdominal fat	0·20
f. Omental fat	0·06
g. Brain	0·18
h. Skin of abdomen	0·72

In these analyses the organs were not put into spirit at all.

The following are the analyses that have been made by Dr. Halliburton:

1. Male (E. D—), æt. 73, under the care of Mr. Lunn. "Was œdematous and swollen at time of death."

The analytical results were as follows:

a. Blood (clotting imperfect)
b. Pleuritic fluid (had clotted)
c. Peritoneal fluid
d. Pericardial fluid } had not clotted
e. Cerebro-spinal fluid
} No mucin.

Tissue.	Percentage of mucin.
a. Tendo Achillis	1·42
b. Muscles	Trace.
c. Parotid gland	0·188
d. Submaxillary gland	0·159
e. Pancreas	0·185
f. Lymphatic glands	None.

2. Male (R. G—), æt. 52, under the care of Dr. Wilson Fox in University College Hospital. Duration of disease eighteen months. Patient died in the swollen condition. Much sub cutaneous fat found post mortem.

The analytical results were as follows :

	Percentage of mucin.
a. Cerebro-spinal fluid *b.* Ascitic fluid	None.
c. Brain	Trace.
d. Skin of abdomen	0·38

3. Male (G. M—), æt. 47, under the care of Mr. Lunn ('Clin. Soc. Trans.,' vol. xv, p. 85; vol. xvi, p. 264). Duration of disease at least five years. "Was puffy and swollen before he died."

The analytical results were as follows :

	Percentage of mucin.
a. Pericardial fluid	None.
b. Skin of wrist	0·37
c. Muscle	Trace.

The skin had been in spirit for a year before it was received by Dr. Halliburton; the mucin obtained is therefore probably below the real quantity present.

4. Female (S. B—), æt. 60, under the care of Dr. Savage, Bethlem Hospital. Duration of disease five years. Patient died in the swollen condition.

The analytical results were as follows :

	Percentage of mucin.
a. Skin	0·237
b. Muscle	None.

The general conclusions to be drawn from those of the foregoing analyses in which the results have been given in percentages are as follows :

Skin.—This tissue has been examined in most of the cases, and in ten the analysts have stated their results numerically. The lowest percentage of mucin obtained was 0·012, the highest 0·81. In two cases there was an increase of mucin, the percentages being 0·81 and 0·72; the average amount in normal adult human skin being 0·385 per cent. The average of the ten

analyses gives a number (0·374 per cent.) which is approximately the same as in normal skin.

Connective tissues.—The tendo Achillis has been examined in one case, and the percentage of mucin obtained was 1·42. The cardiac tendons have been examined in four cases, and in all there was an increase of mucin, the average number obtained from these four analyses being 1·65 per cent. The average percentage in normal tendinous tissues is 0·521.

Other organs.—The spleen has been examined in two cases, and in one gave a large percentage of mucin (2·21). The lungs have been examined in the same two cases, and in one case gave a high percentage of mucin (0·72). The liver and brain were examined twice, and the intestine, submaxillary gland, and pancreas have each been examined once; they gave low percentages of mucin, but the amount present in these tissues, when normal, has not been investigated. The parotid, which normally contains only a trace of mucin, gave in the one case in which it was examined a comparatively high percentage of mucin (0·188); this was even higher than the percentage obtained from the submaxillary gland of the same patient (0·159).

Fluids.—The blood has been examined in one case, but no mucin was discoverable in it. It, however, showed very imperfect coagulation, a point in which it resembled the blood of animals in which the disease had been artificially produced. The pericardial, peritoneal, and cerebro-spinal fluids have each been examined in two cases, the pleuritic fluid in one, but in all no mucin was found. There has been no record of mucin having been found in the urine.

It is seen from the foregoing summary of the results of analysis that the increase of mucin, as found by Dr. Charles in Dr. Ord's first case, has not been found in anything like so great an amount in subsequent cases; nor is the increase so marked as in the experiments on animals. In certain cases this is accounted for by the fact that the patients have not died while in the typical swollen stage but in the subsequent atrophic period of the disease; and in other cases the subcutaneous connective tissue has become replaced by fat, and in other cases still the analyses are to a great extent vitiated

by the keeping of the specimens for long periods under alcohol before analysis.

In the case of animals it is easier to avoid all such sources of error; but even in the analyses just given it will be found that sometimes one, sometimes more than one, organ shows some increase of mucin.

The source of mucin in the body is twofold:

1. It results from the degeneration of the protoplasm of epithelium cells, as in the goblet cells of mucous membranes, and the cells of the acini of mucous glands like the submaxillary. In the myxœdema of human beings this source of mucin has not been to any great extent investigated. The most important analysis bearing on this point is the one analysis of the parotid gland which has been made, and which showed a distinct increase of mucin. This is interesting in connection with Prof. Horsley's experiments on monkeys, in which it was shown that in the myxœdema artificially produced in them the cells of the parotid, which normally secrete clear saliva, secrete a viscid saliva; by the microscope the cells were found swollen by mucinogen, and by chemical analysis mucin was found to be greatly increased in amount.

2. It forms a constituent part of the ground substance or stroma of connective tissue in which the cells and fibres are embedded. This substance is chemically a muco-albuminous material. One ot its constituents is mucin, the other a proteid of the globulin class, which in its reactions resembles the serum globulin or paraglobulin of the blood. In the chemical investigation of myxœdematous tissues only one of these constituents, viz. the mucin, has been estimated. It would make the investigation more complete in future analyses if the globulin were also estimated and the amount present compared with that in normal tissues. In new and loose connective tissues the ground substance is present in greater amount than when the fibrous (collagenous) material replaces it in a later stage. This is illustrated by the fact already noted of the higher percentage of mucin in the skin of infants as compared with that of adults. In myxœdema

it seems that the swelling is at a certain stage due to the increase of this ground substance, and hence the increased percentage of mucin, but at later stages, when white fibres or fat cells have permeated it, the increase of mucin is not so marked.

Part II.

The second part of this report deals with the results of the chemical investigation of the tissues of animals. The animals were those in which the thyroid gland had been removed. Some comparative analyses were also performed with the tissues of animals in which the thyroid gland had not been removed. In these experiments the operations were performed by Prof. Horsley at the Brown Institution, and the chemical analyses by Dr. Halliburton at University College.

The question which has been the chief subject of chemical investigation is the percentage of mucin in the tissues and fluids of the body.

The first series of analyses made were those which have already been published in Prof. Horsley's Brown Lectures ('Brit. Med. Journal,' vol. i, 1885, p. 211). In the tabular form in which they then appeared they illustrate very forcibly the fact that the percentage of mucin is increased in the tissues after thyroidectomy. The increase is not only marked in the connective tissues but also in the salivary glands. The presence of mucin in large amount in the parotid which normally contains none is especially noteworthy. This chemical result was confirmed by microscopical examination, the cells of the acini being swollen with mucin and simulating those of a mucous gland like the submaxillary. Another important fact is the presence of mucin in the blood in increasing amount as the myxœdematous condition of the animal became fully developed. The table is as follows:

Animal.	Mucin in parts per 1000.					
	Skin and subcutaneous tissues.	Tendon.	Muscle.	Parotid.	Sub-maxillary.	Blood.
I. Normal.						
Monkey No. 1 *a* . . .	·89	·39	0	0	—	0
„ „ 9 . . .	·9	·5	0	0	Trace	0
II. Abnormal after thyroidectomy.						
Monkey No. 1 lived 55 days	3·12	2·55	0	·72	6·0	·35
„ „ 3 „ 32 „	—	—	—	—	—	Trace.
„ „ 5 „ 49 „	2·3	2·4	Trace	1·7	3·3	0·8
„ „ 10 „ 7 „	·45	·904	0	Trace	·16	Trace.

In the above animals the blood was further examined. In monkeys Nos. 1, 3, 5, and 10 clotting of the blood took place very slowly, leading to the formation of a well-marked buffy coat, whereas in normal monkeys the blood coagulates quickly without the formation of a buffy coat. The percentage of proteids in the serum was found to be approximately the same in both normal and myxœdematous monkeys (about 4 to 5 per cent.); the serum globulin and serum albumin being present in about equal amount. In one case the temperature of heat coagulation of the serum albumin was rather different from the normal. The urine of monkey No. 3 contained a small amount of mucin.*

Since the publication of the above a few more analyses have been made of monkeys' tissues as follows:

Monkey 6. Death twenty-nine days after thyroidectomy. Very marked symptoms of acute myxœdema. (*Vide* Experimental Report.) Post-mortem changes evident.

The following are the results of chemical investigation:

	Mucin in parts per 1000.	
a. Blood . .	Trace .	Buffy coat of clot well marked.
b. Skin . .	1·08	
c. Tendon . .	1·5	
d. Muscle . .	0	
e. Parotid . .	3·08	
f. Submaxillary .	10·36	
g. Mesenteric glands .	Trace	

* The urine in the other cases was not examined.

On comparing these results with those in the tables a very marked increase of mucin is seen.

Monkey Y. Lived 104 days after operation. Well-marked symptoms and post-mortem appearances.

	Mucin in parts per 1000.
Skin	2·57

Monkey Z. Very severe symptoms. Very marked myxœdema of eyelids, &c. Lived three weeks after operation.

	Mucin in parts per 1000.
Skin	2·63

In monkeys Y and Z the percentage of mucin in the skin is much higher than normal.

Monkey 21 (Gipsy). (*Vide* Expl. Report) This monkey was not myxœdematous, being kept at a high temperature. It lived 121 days, approximately four months.

	Mucin in parts per 1000.
a. Skin	1·4
b. Tendon	·63

In this monkey the percentage of mucin is approximately normal.

For the sake of further comparison certain secreting glands have been examined in healthy monkeys as follows:

	Mucin in parts per 1000.		
	Pancreas.	Parotid.	Submaxillary.
Monkey 11 *a* . . .	·13	—	—
„ 12 *a* . . .	2·76	0	Trace.
„ 12 *c* . . .	—	Trace	5·12
(Death from dysentery.)			
„ 14 *a* . . .	0	—	—

The amount of mucin in the pancreas is seen to be very variable in those animals from which the thyroid has not been removed; no analyses have been made of the pancreas in myxœdematous monkeys. In monkey 12 *c* an exceptionally high percentage of mucin was present in the submaxillary gland.

A few analyses have been also made with regard to the

amount of mucin in other animals. Some of these animals, however, do not show the same symptoms of myxœdema after the removal of the thyroid in the same way that monkeys do. (*Vide* Expl. Report.)

The results of the chemical investigation of the tissues of four pigs are as follows :

	Percentage of mucin.						
	Blood.	Pancreas.	Sub-maxillary.	Parotid.	Muscle.	Tendon.	Skin.
Pig No. 4. Healthy	0	·009	·415	Trace	0	·408	·209
Pig No. 1. Died* 10 days after thyroidectomy	0	—	·6	0	0	·31	·6
Pig No. 2. Died† 57 days after thyroidectomy	0	Trace	·21	Trace	0	·42	·32
Pig No. 3. Died. (Number of days after thyroidectomy not noted)	0	—	·042	Trace	0	·308	·302

In the blood of pig No. 2 there was a well-marked buffy coat on the clot; this is accounted for most readily by the fact that when the animal was killed it was suffering from a febrile affection; there was also pleurisy, and the pleuritic fluid when removed clotted spontaneously : it contained no mucin. Clotting of the blood was normal in pigs Nos. 1, 3 and 4. The proteids of the serum were in all cases normal. The lymphatic glands were examined in the case of pig No. 3, and no mucin was found. The percentage of mucin is seen to be approximately the same in the healthy animal as in those in which the thyroid was removed; the latter, however, did not show definite symptoms of myxœdema. (*Vide* Expl. Report.)

The blood of a donkey from which the thyroid had been removed was examined 205 days after the operation. No mucin was found in it.

The blood of a sheep from which the thyroid had been re-

* Accidentally killed by overdose of chloroform given for examination of inflamed prepuce (see Expl. Report).

† Caught "swine fever," etherised and killed by bleeding (see Expl. Report).

moved was examined twenty-seven days after the operation. No mucin was found in it, and the proteids of the serum were both qualitatively and quantitively normal (serum globulin 3·55, serum albumin 4·13 per cent.). The animal was killed nearly two years afterwards, it having developed myxœdematous symptoms when it was shorn and exposed to cold. It showed no signs of myxœdema before this. The blood, pericardial and cerebro-spinal fluids, then contained no mucin. The peritoneal fluid contained a doubtful trace. The urine contained abundance of mucin. The "gelatinous" and fatty connective tissue from the anterior triangle of the neck contained ·09 per cent. of mucin. Although there are no analyses in healthy sheep to compare with this result it seems to denote a considerable increase in the amount of mucin present, normal adipose tissue in other animals yielding only imponderable traces. The sterno-mastoid muscle and lymphatic glands were also examined from the same animal, and found to contain a trace of mucin.

W. D. Halliburton.

SECTION V.

REPORT OF EXPERIMENTAL RESEARCHES

INTO THE

FUNCTION AND PATHOLOGY OF THE THYROID GLAND

IN CONNECTION WITH THE CONDITIONS TERMED MYXŒDEMA, CACHEXIA STRUMIPRIVA, CRETINISM, ETC.

I. Historical Sketch.

Many theories concerning the function of the thyroid gland were put forward by the early physiologists* and pathologists. These theories were mainly based upon anatomical considerations, such as the vascularity of the gland, its relation to the vessels supplying the brain, &c. To these must be added the view of Sir John Simon, who considered that each lobe of the gland had a special nutritive relation to the corresponding cerebral hemisphere of the brain. It does not appear, however, that any of the earlier authors submitted their theories to the test of experiment, and therefore we need not here concern ourselves further with their views.

The first experimental investigation of the subject was made in England by Sir Astley Cooper.† He removed the glands wholly, "lacerating the arteries to prevent hæmorrhage," from

* Guyon, Liebermeister, Luschka, &c.

† 'Guy's Hospital Reports,' vol. i, 1836, p. 454.

two puppies ten weeks old. The only effect he observed was dulness, and that they were obviously "ill." This lasted till the thirteenth day. When the wounds had healed, "and the animals quite recovered," he killed them and found "that the glands had been cleanly removed."

Von Rapp followed him with two experiments, one on a dog and one on a goat. He observed no ill-consequences to follow the extirpation of the normal thyroid glands from these two animals, but that removal of the goitrous gland in a few dogs was rapidly and invariably fatal, but unfortunately he did not describe the symptoms in these latter cases.

In the following year Bardeleben made several experiments, which have been lately quoted in discussing this subject, and hence they are worth repeating in some detail.*

Exp. 1. Dog (six and a half weeks after extirpation of spleen). Total extirpation of thyroid. Result: Died in five days with typical symptoms (*vide* infra, p. 82) of "tetany."

Exp. 2. Dog. Total extirpation of thyroid. Result: Remained well for seven weeks.

Exp. 3. Dog (four weeks after extirpation of spleen). Total extirpation of thyroid. Alive six years later.

The deductions from these experiments will be reserved to the summing up of all the experiments on dogs.

In 1859 Schiff published the commencement of the very remarkable researches he made on this subject, but his experiments at that time were not directed merely to the removal of the thyroid gland, and consequently it can only be said here that they showed distinctly the generally fatal termination of that procedure. Schiff also quoted Lacanchie to the same effect, but Lacanchie's experiments seem to have been incompletely performed, since death usually followed in twenty-four hours. Hegar and Simon removed the thyroid from an old cat which was alive and well a month later.

The next investigation was that of Zesas, who removed the

* For these facts and some of the other references to the early authors I am much indebted to the admirable history of the subject contained in a paper by Dr. Ferdinand Fuhr, published in the 'Archiv für Experiment. Pathologie und Pharmacologie,' 1886.

spleen and thyroid glands in dogs and in cats with antiseptic precautions. He showed distinctly that removal of the thyroid gland was fatal to the animal, that it became stupid and died comatose with convulsions; further, that leucocytosis occurred. The following is a list of his experiments:

Exp. 1. Dog. Thyroid extirpation. Died in 12 weeks.
Exp. 2. Dog. Thyroid extirpation. Died in 16½ weeks.
Exp. 3. Dog. Thyroid extirpation. Living 2 years later.
Exp. 4. Cat. Thyroid extirpation. Died in 16 weeks.

From the anæmia of the brain observed in the animals dying of cachexia strumipriva Zesas thought that the thyroid regulated the cerebral circulation.

Schiff returned to the subject in the same year, viz. 1884, and completely established the general effects observed in the carnivora (*vide* infra, p. 68). He further stated that it was possible to avert the effects of the loss of the gland by intra-abdominal transplantation of portions of the gland.*

Colzi stated that total extirpation of the gland in rabbits was not fatal, but he confirmed its general effects on the carnivora. He also asserted that by transfusion these evil results could be avoided. From his experiments he concluded that a condition of general constitutional poisoning similar to uræmia was the consequence of the loss of the gland.

At the same time Wagner, experimenting on dogs and cats, obtained similar results, and further observed hypertrophy of the one lobe to follow removal of the other.

Sanquirico and Canalis performed seven total extirpation experiments in dogs, all proving fatal within sixteen days.

Albertoni and Tizzoni showed that rabbits were unaffected by loss of the gland, and further, that of 24 dogs in which the gland was completely extirpated, 4 survived. Rogowitsch has lately published a preliminary account of experiments on dogs, in complete harmony with the observations of all the later investigators.

In 1884, I commenced myself a series of investigations into this subject, experimenting upon monkeys as well as upon the carnivora and other animals. The results in the former class

* Incomplete extirpation.

will be detailed presently, and those in the latter were found to harmonize with the observations just quoted, and which will be summed up directly.

In June, 1885, Fuhr began his investigations on the effects of extirpation of the thyroid in dogs, from which he concluded that the operation was fatal within twenty-one days on the average, and that this result was not due to septic changes in the wound or injury of neighbouring parts. Further, that when an animal survived it was because accessory thyroid glands existed which supplemented the loss of the original gland.

Finally, Munk, during 1887, has studied the subject, but while in the main confirming other observers, he thinks that the results he obtained were not due to loss of the thyroid gland, but to certain "injuries" inflicted on surrounding parts. This must be borne in mind when his facts are quoted in the subsequent pages.

(The above-described results were challenged by Kaufmann, from whose description, however, it is clear that the submaxillary gland was removed but not the thyroid.)

II. Introduction.

Before describing the lines of research on the function of the thyroid gland in various animals, some preliminary remarks must be made on the methods and principles adopted by different authors.

It is clear that unless certain obvious precautions have been taken in each case the experiments cannot be grouped together in discussing the points they illustrate.

The first precaution is, of course, asepsis of the wound. This appears to have been obtained in the large majority of cases, with the exception of those of the earlier experiments. But, though of primary importance on general principles, this point loses most of its influence in view of the fact that the peculiar array of symptoms which follow this operation are not to be attributed to mere septic cellulitis of the neck, when

the thyroid gland is still in active function, since inflammation of the tissues of the neck has never been observed to produce such effects, as those characteristic of the cachexia. Moreover, the cases in which primary union occurred are very numerous, and, nevertheless, the cachexia followed the loss of the gland in the same way as in those where suppuration happened in the wound.

The second point, on which much stress is laid by many, is the injury possibly inflicted on surrounding parts, and notably to the nerves behind the gland, the sympathetic, vagus, and recurrent laryngeal. It is easy to avoid these structures during the operation and microscopic investigation of them, after death has followed the usual symptomatology, has failed to show that they are injured in the slightest degree.

A third point is that which Kocher originally advanced as the explanation of the occurrence of cachexia strumipriva, and one which was strongly supported by Lombard, viz. injury of the trachea, producing conditions leading to the production of chronic asphyxia. However, no evidence of such chronic asphyxia has ever been forthcoming; and finally, in no experiment has such injury to the air-passages ever been observed. This theory, therefore, is obviously of no moment.

Finally, and this is most important, the presence or absence of accessory thyroid glands in cases where animals have survived the operation of excision, has not always been ascertained, and consequently some experiments must remain as of indefinite value.

It will now be convenient to enumerate briefly the general principles upon which the work of experimental investigation of this subject has been based, and to employ this enumeration as an index whereon to group the results observed.

The assumption that the thyroid gland is of importance to the healthy function of the body has hitherto been tested as follows:

1. By anatomical research to find whether the gland bears a different relation to the body at times of varied requirements of function.

2. By experiment to find whether removal of the whole

gland produces disturbance of normal functions of the body, and if so what is the nature of that disturbance?

3. By experiment to find whether removal of portion of the gland is followed by supplementary extra action on the part of the remainder (in proportion to the needs of the organism*), as evidenced among other things by hypertrophy of the part left.

4. By experiment to find whether after removal of the gland it is possible by transplantation, &c., to prevent the usual fatal issue.

III. Details of Researches.

1. *Relation of the Gland to the Body at Different Ages and under various circumstances.*

From Huschke downwards all observers are agreed in admitting that the importance of the gland to the newborn and rapidly-growing animal is much greater than to the adult, as evidenced especially by the immensely higher value it possesses in weight proportionate to that of the whole body, and to the fact that its removal in a young animal is invariably followed by the myxœdematous or cretinic state. In man the acini are already found at an early period of intra-uterine life, viz. six months, and all the tissues show active change. The reverse is seen in approaching senility (which condition, it may be noted, closely corresponds in many particulars to the myxœdematous state), where the gland is shrinking, degenerating, and becoming fibroid and cystic if not already markedly atrophic.

While the metabolic importance of the gland is so obvious in early life and as clearly diminishes in old age (*vide* also p. 80), its variations in connection with certain states of physiological activity do not seem to be so well ascertained, though traditionally occurring. Thus it has been stated that in the condition of pregnancy, of menstruation, and after sexual

* The necessity of recognising the bearing of this latter observation has apparently escaped notice by the observers who have discussed this point; see p. 71.

excitement, the gland is enlarged, and it is probable under these circumstances, the gland is frequently the seat of increased function. Still there are so many exceptions that this part of the subject requires re-investigation, and especially in connection with the particular condition of tissue change in which the individual observed happens to be, for it may very well happen in some cases, *e. g.* in pregnancy, that there may be coexistent some early but grave condition, *e. g.* tissue degeneration, which may in part be causative of the increased functional activity of the gland.

2. *Effects of Removal of the Gland.*

The operation of excision of the gland is the line of experiment which, as set forth in the historical sketch, has occupied the attention of all observers. The simple removal of the lobes on either side of the trachea naturally commends itself as most likely to yield results which would solve the problem, since thereby (provided always that the operative procedure were perfect, not merely in technical detail of extirpation, but also in securing immediate union of the wounded tissues) the system would be suddenly deprived of the function of the organ, and therefore, by reason of this instantaneous alteration, be the more likely to exhibit in their strongest form any pathological consequences which might follow.

In fact *a priori* reasoning, with the reservations made on p. 71, would lead us to accept the results of extirpation of the gland as final. Nevertheless, in the absence of complete knowledge of the physiological relations of the parts involved in the operation, we must always be open to receive other interpretations of the phenomena. (Such have recently been put forward by Munk in reviving the view that the effects about to be described are not consequent upon the loss of the thyroid gland. He expresses his belief that the symptoms are due to certain damages (*Schäden*) sustained during the operation by surrounding parts; unfortunately, however, he omits to mention what these injuries are.)

Putting aside all cases in which any complications have

been shown post mortem to have been present, we may now sum up the effects observed by different experimenters on various kinds of animals.

(*a*) *Rodents.*—A number of observations have been made on rats and rabbits with uniformly negative results. The explanation of this interesting fact is still wanting, and it is very desirable that fresh investigation should be made in this class of mammals.

(*b*) *Carnivora.—Cats.*—The removal of the gland in this animal has almost invariably been followed by death after exhibition of the same symptoms as those of the myxœdematous cachexia in dogs (*vide* infra).

In 2 instances negative results were obtained (viz. Simon 1 and Horsley 1*). In both it was noted that the animal experimented upon was old. In Simon's case the animal was simply described as well a month later, in the second instance the animal grew extremely fat and became lethargic before it was killed 108 days later.

Dogs.—Total extirpation. All observers are agreed that in the enormous majority of cases (perhaps over 95 per cent.†) of supposed complete extirpation (without complication; see p. 71) of the thyroid gland the animal succumbs at the end of the following train of symptoms, the duration of which varies from a few days to four or five weeks, sometimes, though very rarely, two or three months.

The first effect of the removal of the gland in the dog is to produce loss of appetite—occasionally this is increased at first—dulness, and apathy. Soon fibrillar twitchings are noticed in the muscles, especially those of the trunk and thighs. Following these we may observe that the whole body and the limbs are greatly agitated by violent clonic convulsions affecting all the extremities and the trunk. These attacks of spasms are accompanied by violent dyspnœa, which is a noteworthy symptom, since it has been recognised clinically in cases both of disease of the thyroid gland and of extirpation

* Certain unpublished experiments which are introduced briefly in this report will be described later in full detail in a communication to the Royal Society.

† Every one of Sanguirico, Canalis, and Munk's dogs succumbed to the total extirpation.

of goitres where there was no pressure on the air-passages to account for the respiratory difficulty.*

Usually during these attacks of spasm and tetanoid rigidity the animal lies on its side with its limbs extended and the head thrown back. Often it is in a half comatose state, from which it can be roused, except in the final stages, when it passes into a condition of complete unconsciousness, and death results. Thus the nerve phenomena exhibit a close parallel to those seen in acute uræmic poisoning, and this parallel we shall find in discussing the symptoms in monkeys is remarkably exact.

Coupled with the state of spasm is that of paresis, this mostly affecting the voluntary muscles of the limbs, and being rarely marked until the attacks of spasm have reached a considerable height.

To the foregoing facts, which, summed up, present the ordinary picture of the condition seen in the dog, must now be added certain trophic and other symptoms which have been noted by various observers.

Thus, frequently the animal emaciates if it survives longer than the few days within which the fatal termination often occurs. The marasmus is probably in part the simple consequence of the loss of appetite, and, later, of the paresis of deglutition.

In a few instances vomiting has occurred, and usually when the general convulsions are at their height.

Both Fuhr, and Sanguirico and Canalis, observed that in many instances conjunctivitis and keratitis followed the operation of extirpation of the gland. It would appear from their accounts that this was not due to simple irritation, *i. e.* infection of the conjunctival sac, but in view of the general depression of nutrition it is obvious such a complication might readily arise without any direct and special influence of the loss of the gland.

Two important symptoms have yet to be described, viz. the lowering of the general temperature of the body and anæmia.

As a rule the temperature gradually falls (after a prelimi-

* Schiff found that artificial respiration postponed the fatal issue in cases where death was imminent from this dyspnœa.

nary rise) and becomes subnormal before death. In cases where death rapidly occurs, this fall of temperature in dogs has not always been observable, but of its usual occurrence there is no doubt.

Allied with the fall in the body temperature are changes in the blood. There is not only anæmia due to loss of corpuscles, but the relative proportions of these constituents are also altered, and marked leucocytosis occurs.

The *post-mortem appearances* usually revealed nothing. Schiff makes the suggestive observation that in two instances he observed œdema of the tissues, but whether in dogs or cats is not stated. This œdema he attributes to paralysis of the vaso-motor nerves.

Microscopical examination, especially of the nerve-centres, has revealed little save general congestion and œdema (described by Rogowitsch as parenchymatous inflammation), but this can in most instances be accounted for by the mode of death, *i. e.* "asphyxia."

Chemical examination.—No chemical investigation of the tissues has yet been made in the case of dogs dying after complete removal of the thyroid.

3. *Survival by Dogs of the Operation of Complete Extirpation.*

Certain observers have stated that they have removed completely both lobes of the thyroid gland in dogs, and that in a few instances death has not followed, although some of the fore-described symptoms were observed. The tabular results of these and others who have not observed such survival are as follows:

Observation.	Recoveries.		Operations.			
(*a*) Bardeleben	noted 2	out of	3	*i. e.*	66 %	about.
(*b*) Zesas	,, 1	,,	4	,,	25	,,
(*c*) Schiff	,, 1	,,	60	,,	1·6	,,
(*d*) Sanguirico and Canalis	,, 0	,,	7	,,	0	,,
(*e*) Fuhr	,, 1	,,	9	,,	11	,,
(*f*) Munk	,, 0	,,	?	,,	0	,,
(*g*) Horsley	,, 1	,,	22	,,	4·5	,,
	—	,,	—	,,	—	,,
Mean	6	,,	105	,,	5·7	,,

This table shows clearly that the enormously high percentages of recoveries from the operation obtained by the older observers in the very few experiments they made are untrustworthy. The especial importance of this observation is owing to the fact that the question raised by survival after the operation is not merely whether the gland is necessary to life, but also whether there is compensation afforded by the coexistence of accessory thyroid glands, and whether the gland is in functional activity in proportion to the requirements of the organism. Unfortunately these further considerations have only recently obtained attention, and therefore the earlier observations are again rendered of less value. Fuhr shows that the one survival observed by him was due to the existence of accessory thyroid tissue, and from this case and experiments of partial extirpation he concludes that about one third of the whole weight of thyroid structure normally existing in any given animal is necessary to its life. In observation (*g*) the dog was extremely old, and doubtless the gland was no longer of vital importance. This case is regrettably incomplete, since dark glands found in the neck at the post-mortem (many months after the operation) and considered to be lymphatic, were not examined microscopically, having been mislaid. The lobes of the thyroid had been completely removed.

Consultation of the original memoirs noted in the historical sketch shows that the fact of survival was in no wise dependent on the rapid union of the wound, for in some cases this did not occur. We must conclude, therefore, that the removal of the whole gland is, except under very rare circumstances, fatal to the carnivora, and that the circumstances referred to appear to be (1) the existence of accessory thyroid tissue, and (2) the previously diminished functional importance of the gland.

The functional value of the gland in the carnivora has further been tested by experiments in which one lobe has first been removed and subsequently the other. With the exception of Schiff all observers who performed this experiment (Sanguirico and Canalis, Fuhr, Horsley) state that the second operation is invariably fatal. Schiff directly affirms that if twenty days be allowed to elapse between the operations that

he has seen "several" animals survive, even though they may have exhibited symptoms of a transitory but unmistakable nature. This point requires re-examination in view of this contradiction.

4. *Compensation by Hypertrophy of parts left behind.*

A further point of great interest, but one which must be again examined from the present position of the subject, is the existence or non-existence of hypertrophy of one lobe after removal of the other. Hypertrophy has been observed (Wagner, Rogowitsch, Horsley) in some cases but not in others (Sanguirico and Canalis, Fuhr, Horsley).

The difference between these observations may possibly be due to the great variations in nutrition between the different animals, and the almost invariable diminution in activity of the normal functions after operative interference. The most marked instance of hypertrophy of the lobe left behind observed was in the case of a young dog, which, after the one lobe was excised, rapidly increased in size and weight (almost doubling the same), and in which all the functions of the body, including procreation, were extremely active.

Conversely the opposite, viz. no hypertrophy, was observed where the operation had been performed on an old adult or on a younger animal, which showed no increase of body weight or activity. This matter, like several other of the points here raised, is well worthy of reinvestigation.

The same observations are applicable to those cases in which a portion of a lobe is left behind after extirpation of the rest. Thus in some instances no change (Fuhr) has been observed in the part remaining, whereas supplementary hypertrophy has been noted in cases of incomplete removal of the gland in man.

As an illustration of the relation between the functional activity of the gland and the general nutrition of the body, this increase or non-increase of remnants of the gland is particularly important.

5. *The Influence of Transplantation of the Gland or of its Gradual Destruction in averting the Fatal Issue of its Loss.*

In close connection with what has just been stated are some unconfirmed experiments of interesting character, which have been performed by Schiff and Munk. The former investigator removed the thyroid gland completely in a dog and then transplanted in the abdomen of the animal the living thyroid gland of another dog. He states that, although on subsequent examination a considerable time after the operation, practically none of the transplanted gland was discoverable, yet that the animal survived the loss of its own gland. Resting on this observation, he was led to believe that the gland manufactured something that was specially necessary to the nutrition of the central nervous system, but that the organism could be gradually accustomed to its absence, and the process of adjustment he believed to be met by the operation of transplantation. Munk exposed the thyroid by the usual incision; he then freed, by shelling out, each lobe from its bed and thus destroyed anastomosis with surrounding vessels, and finally ligatured all the vessels supplying the organ. In the proportion of 20 per cent. he succeeded in preserving alive animals subjected to this operation, and he states that the fatal cases were only those in which septic inflammation of the wound occurred. Further, he showed that in one instance little, if any, of the gland was to be found in its proper site ten days after the operation. Now, neither of these sets of observations can be held to decide the point at issue and for which they were designed, viz. the economic worth of the gland to the organism. For all observations have shown that, except in very young animals, the organism can be gradually brought to adapt itself to the loss of the gland for a certain time at least, and that for this adaptation the most essential factor is the leaving of some gland-tissue in the body.*

* The history of Munk's experiments is unfortunately incomplete, since the examination of the surviving animals has yet to be made in respect to accessory glands. Moreover, he discards all experiments, 80 per cent., in which primary

There is a noteworthy difference in the two series of experiments, viz. that in the one, living thyroid tissue is placed in the body, while in the other, it is hoped that only dead thyroid tissue is left. In both, however, the same condition is essential to the preservation of life, viz. that the portion transplanted or left should not be destroyed at the time of operation. There is, of course, in the first set of experiments, no danger of this, but in the second Munk expressly states that when the wound was septic and consequently the rapidly complete destruction of the thyroid tissue was made a matter of certainty, the animals invariably died with characteristic symptoms. Of course, under these circumstances, the experiment was, in truth, converted into one of complete extirpation. The death-rate of the whole number of Munk's experiments was 80 per cent. In the remaining 20 per cent. he obtained primary union, and then observed that the animals (which were of various ages) survived,—that in those where the destructive absorption of the gland is gradual there is opportunity for the organism to accommodate itself apart from considerations of age, &c. The further history of the animals in both Schiff's and Munk's experiments is wanting and obviously would be of much value.

6. *The Effect of Injecting an Emulsion of the Gland into the Blood Circulation.*

Ewald has shown that if the product of crushing the thyroid gland in an innocuous fluid be injected into the circulation, various toxic symptoms are produced.

In view of the observations of Wooldridge on the presence of poisonous fibrinogenous compounds in healthy tissues, these results, though most interesting, are not remarkable or peculiar to the thyroid gland.

union was not obtained. This scarcely should be done in view of the well-known fact that the existence of an open suppurating wound of the thyroid region does not cause death with the typical symptoms when the glands are in position.

7. *Further Relations of the Thyroid Gland with other Processes in the Body, notably Hæmatopoiesis.*

It has already been remarked that leucocytosis and anæmia have been observed to follow complete removal of the gland in the carnivora. This subject must be again referred to when we review the effects of the operation in monkeys, but it is now necessary to mention what evidence is to hand bearing on the question in the carnivorous order.

In the first place it has been known for many years (Baber) that there exists in the thyroid gland of dogs a quantity of tissue which is best described as embryonic, and which in certain parts shows evidence of transition into the ordinary alveolar arrangement of the mucinous glandular part of the organ. But in others, this embryonic tissue presents a truly lymphoid or splenic type with a rich blood-supply, and, moreover, it then forms nodules or islands which in stained sections of the glands stand out in strong contrast to the ordinary tissue. Similar foci of embronic tissue have been studied by Wölfler in the capsule of the gland, and especially in connection with the origin of new growths therein. Anatomically, therefore, we have reason to believe that the functional duty of the thyroid is not singly concerned with the metabolism of mucin or its antecedents, but that it possibly embraces other factors of life. As before mentioned, removal of the whole gland in dogs and cats produces anæmia, which subsequently becomes profound. Now, this anæmia may be primary or secondary in relation to the removal of the gland. If the gland is really hæmatopoietic, and especially provides for the constant production of the corpuscular element of the blood, then anæmia following upon its destruction would be very easily explained, but it may well be that the alteration produced in the metabolism of albumins (especially of those in active circulation) by the extirpation exerts a similar injurious influence on the corpuscular part of the blood as a tissue.

Removal of the gland is stated by some to cause hypertrophy of the spleen (see effects on monkeys, p. 81), and removal of

the spleen has been observed in man to cause swelling of the thyroid gland; but these interchanges of function (?) are of rare occurrence, and their intermittence (like most questions of nutrition) will only be explicable when we have a completely trustworthy series of observations on the relations of the spleen to the general nutrition of the body.

Enumeration of the corpuscles in the thyroid vein and artery respectively, has shown that there is a distinct surplus in the former vessel (Horsley). Of course such an observation proves nothing one way or the other when taken alone, since it may well be that the intraglandular changes in the fluid constituents of the blood would disturb the proportionate amounts of corpuscles and plasma in the two vessels. Coupled, however, with the anatomical and pathological facts before noted, it would seem to lend support to the old view that the gland was concerned in hæmatopoiesis and not merely of corpuscles, but also of the other elements of the blood.

c. Ruminants.—Ungulates.—Experiments have been made in very few instances of these orders of animals and only by two observers (Rapp, Horsley). Thus, complete extirpation is said to have been performed on:

No. 1 goat. Result: Survived (duration not stated) (Rapp).

No. 1 sheep. Result: Surviving (2$\frac{1}{3}$ years since removal).

No. 2 sheep. Result: Died of *acute myxœdema*, brought on by accidental exposure to cold, 1$\frac{2}{3}$ years after extirpation.

The fatal case in the second sheep is one of much interest, since it entirely negatives the view that the effects of total extirpation are due to injury of neighbouring structures in the course of the operation, and proves that the myxœdematous state is produced by the loss of the thyroid. It is worth while, therefore, to mention the leading features in this instance. The thyroid was removed (October 3rd, 1885) with the usual precautions and primary union of the wound resulted. The sheep emaciated, and was weak a fortnight later, but its temperature was normal and appetite good. No marked change was observable in the animal except that it gradually recovered its general nutrition, and apparently became more stupid even than before the operation. In the meanwhile the

wool grew, and not being cut covered the animal very thickly. In view of the approaching summer weather it was shorn in the first week of May, 1887. The weather, which had been mild, became very cold; the animal was then observed to become ill, it lost its appetite, then exhibited the usual symptoms of the acute cachexia, viz. spasms, paralysis, coma, anæsthesia, tetanoid contracture, and fall of temperature to 25° C. It died on May 20th, 1887, *i.e.* 569 days after the operation. The post-mortem examination showed "gelatinous" infiltration of all the subcutaneous tissue, which under the microscope (see Pl. IX) was evidently mucinous degeneration of the ground substance, and by chemical analysis (*vide* 'Chemical Report,' p. 60, by Dr. Halliburton) was shown to be actually mucin. The thyroid gland had been completely removed.

In this instance we have the well-known influence of cold evoking the phenomena of the cachexia in its most acute form. It is interesting to note that the companion animal, sheep No. 1, which was similarly treated but a much stronger and bigger animal, still survives, and will be preserved as long as it will live.

d. Suidæ.—Experiments on pigs have as yet produced negative results, but this, there can be little doubt, is owing to the animals having been kept for an insufficient period after the operation.

e. Solipeds.—One experiment in this order has been published (Horsley), viz. on a donkey, which similarly supports the points established by the experiment just quoted of sheep No. 2. The thyroid was removed on August 25th, 1885. After the operation the animal emaciated in spite of excessive appetite, became weaker, lay down, and the temperature was low. [Most of the wound healed by the first intention, the remainder (about one sixth) by suppuration; cicatrisation was complete by about the end of September, 1885.] After the general appearance of illness had lasted two months the nutrition improved, and no obvious change was noted (the psychical analysis being difficult) until the beginning of March, 1886, when, the weather becoming suddenly severely cold, the animal fell ill, and anorexia, tremors, fall of temperature, &c.,

occurring in the order given, death with all the characteristic symptoms occurred within a week of their being first noted, *i. e.* 205 days after operation.

Post-mortem.—The thyroid gland was found to have been completely removed. All tissues and organs appeared normal (*vide* 'Chemical Report' for examination of the blood).

f. Monkeys.—Investigation of the importance of the thyroid gland in monkeys has unfortunately only been carried on by two observers, Munk and Horsley. Consequently a great many of the facts referred to in the following pages are as yet uncontrolled by the observation of other experimenters, and so we are deprived of such a valuable consensus of opinion as can be found from the results of experiments on dogs.

The facts relating to monkeys will be taken in the same order as they are stated to occur in the carnivora, with supplementary paragraphs where specific differences occur in the phenomena observed in the two classes.

1. *Species Employed.*

In view of the novelty of the subject it is advisable that, as far as possible, the exact position in the scale of each animal should be noted. The following appear to have been employed:

Macacus sinicus Macacus rhesus Cercopithecus	Horsley.	Macacus — ? Inuus ? ecaudatus ? Cercopithecus	Munk.

2. *Survival of Total Extirpation of the Thyroid Gland:*

Observer.	No. surviving.	No. operated upon.	Percentage of survivals.
I. Munk ... (*vide* p.)	2. (*i. e.* Living 4 months after operation)	... 6*	... ? 33%
II. Horsley ...	1. (This animal showed no symptoms for 2 months; then contracted noma, and was killed unfortunately during absence. Hence no search was made for accessory glands.)	... 17	... 5·8%

* Two of the four deaths were apparently typical instances of acute myxœdema; the third, while showing typical symptoms, was ascribed to a dis-

The causes of death in the II series of experiments were as follows:

Acute myxœdema . . .	10 (1 syncope ?)
Chronic myxœdema, *i. e.* cretinism	5
Acute myxœdema and dysentery.	2

3. *Duration of Life in Cases terminating Fatally after Complete Extirpation of the Thyroid.*

In the cases where urgent symptoms arise very soon after the operation, *i. e.* in young subjects especially, the progress to a fatal issue is very rapid. As a rule, the animal exhibits violent tremors, &c., and dies rapidly of syncope, ? &c. In other instances the period of survival after the operation depends upon certain surrounding circumstances, *i. e.* heat, &c. (Horsley), accident (Munk). The average duration of survival was:

Observer.	Average duration of life after operation.	Remarks.
Munk ...	38 days ?	
Horsley ...	Ser. 1. 24 days „ 2. 125 „ *	In Ser. 1 no special treatment was carried out. In Ser. 2 the animals were kept at a temperature averaging 90° F.

Munk states that he only kept his animals at 18° C. = 64·4° F., and that even then the temperature varied greatly above and below that point. In England temperature below 60° F. seems to be always fatal to monkeys in confinement. For the effect of heat *vide* infra, p. 84.

Note on the General Symptoms produced by Complete Removal of the Thyroid in Monkeys.

It must first be stated that in no† case apparently of the total of the twenty-three experiments on monkeys did the

ease termed "erysipeloid" by Prof. Munk; the fourth animal was killed while showing typical symptoms, and also suffering from the "erysipeloid."

* In one case the animal lived six months, dying, like the others, a complete cretin.

† In one case quoted by Munk the union seems to have been tardy.

wound fail to heal up by the first intention, and in no case (Horsley) was there the slightest injury discoverable of the other structures in the neck; nor have accessory thyroid glands been found (not always looked for) in the non-fatal cases. The general course of the symptoms which follow the complete extirpation will be therefore at once divided under the two headings:—(A) Acute Myxœdema; (B) Chronic Myxœdema or cretinism.

(A) Acute Experimental Myxœdema.

4. *Period of Latency after Total Removal of the Gland.*

After the removal of the gland the first symptom appears on about the fifth day, the period of latency varying from the second day to the twelfth day, its duration being almost exactly in direct proportion to the subsequent length of the illness, the longest latency introducing the longest survival. The duration of the period of latency does not depend on the condition of the wound, since the extremes, viz. two and twelve days, have each been observed in animals in which the wound healed by immediate union, consequently, any traumatic cause such as seems to be suggested by Munk can hardly be supposed to be present and effective in two such different instances. On the other hand, the duration of latency is certainly dependent upon the age of the animal to this extent, viz. that in a young animal it is very rarely longer than three days, this on the other hand being exceptional in the adult. And while, however, cases occasionally occur, in which an adult has shown the first symptom within three days of the operation the converse has not yet been recorded.

The condition of the general health and nutrition also affect the duration of the period, as may easily be supposed, the symptoms appearing more rapidly in the weak and feeble, provided the weakness is due to some acute or subacute illness.

Similarly exposure to cold determines an earlier appearance of the symptoms, warmth delaying the same.

5. *Duration of the Symptoms.*

In acute experimental myxœdema* the average duration of life appears to be about twenty-four days, the extremes noted being respectively four and fifty-five days.

The same factors which, as first stated, accelerate onset of the symptoms, shorten (by rendering the cachexia more intense) their duration, *vide* p. 84 (description of chronic experimental myxœdema or cretinism).

6. *Course of the Symptoms.*

The symptoms in the monkey at first are, just as in other animals, entirely nervous, and they may well be summed up as follows: *Motion* tremor, clonic spasm (paroxysmal), contracture, paresis, paralysis.† *Sensation*, paræsthesia, then anæsthesia. *Reflexes* gradually diminished. *Mental* operations, normal at first, are soon diminished in activity, and then follow apathy, lethargy, coma.

Coupled with these more special and earlier symptoms come those of general import, thus: *Temperature*, raised and irregular at first, gradually falls, becomes subnormal. *Appetite*, gradual anorexia after voracity. *Blood*, gradual anæmia and leucocytosis, the blood pressure steadily falling. *Nutrition* notably affected, mucinous degeneration of the connective tissues associated in some instances with marasmus (from want of appetite as well as assimilation), increase of mucous secretion, sometimes enlargement of the spleen, and usually atrophy and falling out of the hair.

* By which it is to be understood, as heretofore stated, that the symptoms to be described run a rapid and *continuous* course, terminating in death.

† Of passing interest are instances in which "functional" paralysis of very extensive nature has been seen in this condition. Thus in two cases complete hemiplegia was observed to be developed rapidly at the end of a paroxysm of clonic spasms affecting both sides of the body. The hemiplegia thus produced affected the face, trunk, and limbs of one side, and lasted a few hours, then passing off equally but quickly. The analogous condition in uræmia will of of course suggest itself here (*vide* p. 69).

This is also the place at which attention may be directed to the exact correspondence of the tremor stage in this acute experimental myxœdema with the "tetany" long noticed as occurring after removal of goitres, with the tremors in early stages of idiopathic myxœdema, with the tremors of exophthalmic goitre and of those in cachexia strumipriva. And moreover, how in all these conditions the tremor is invariably increased by circumstances which tend to dissolution of nerve functional activity, *e. g.* exposure to cold, inhalation of ether, mental excitement, &c., while in the early stages it is suppressed by "voluntary" effort and experimentally by direct excitation of the highest, *i. e.* cortical centres.

In the monkey the symptoms following total extirpation of the gland are precisely similar to those seen in the carnivora, as is shown in the abstract just given. But owing to the greater duration of life in the first-named animal, it is possible to observe certain symptoms which are only exceptionally visible in the dog, &c. In the dog the dyspnœa and spasm of the muscles is often so severe as to mask any other effect. In the monkey, however, this is fortunately not so, the loss of the gland setting up other changes which rapidly assume prominence, while the nervous phenomena are relatively moderate or at least do not obscure those about to be described.

Thus the monkey shows the appearances which are characteristic of the disease known as (idiopathic) myxœdema, the eyelids become puffy with elastic œdema, the features grow heavy and coarse, the skin being rough in some cases and the hair falling out. At the same time the urine is normal, *i. e.* non-albuminous, &c.

The course of the temperature is remarkable, inasmuch as it is in accord with the condition of the human myxœdematous patient. The depth to which the temperature falls is usually greater in those cases where the spasms and paresis have been prolonged over a large amount of time. Munk regards this fall of temperature as merely the effect of insanitary surroundings, but this opinion only rests on the view which he takes of the pathology of the affection, namely, that the symptoms are caused by as yet undescribed injuries

received during the operation by the important structures in the neck.

Although his view of the question is thus incomplete in its most essential particulars, it must be mentioned here in view of the use that has been in this report made of Prof. Munk's records of his experiments.

The next point of especial interest among the symptoms in the monkey is the anæmia and leucocytosis invariably found. This, as Munk suggests, may be due to the animals living in confinement, &c., but when anæmia is observed in such animals independently of any operative interference it never takes the remarkably pronounced and rapid form as seen after removal of the thyroid.

The possible connection of the gland with hæmatopoiesis has already been referred to at p. 75, while discussing the symptoms in the carnivora. As both the histological and physiological arguments there stated are applicable to monkeys the matter need not be reopened here.

The final facts for special consideration are the excessive mucinous excretion and the condition of the tissues affected with myxœdema, phenomena of the greatest interest, and while requiring time for their development, are never seen in the dog, since that animal cannot long survive the loss of the gland.

In the majority of cases recorded there was noted an obvious increase in the amount of mucus excreted by the various organs, notably the intestinal canal and the bladder. In a few instances hyperactivity of the salivary glands and a remarkable abnormal secretion of mucus by the parotid has been chemically (*vide* Chemical Report), histologically, and physiologically demonstrated, the cases being those in which marasmus was relatively slightly marked.

Concomitant with the excess of mucinous secretion is the existence of mucinous degeneration. This effect was visible to the naked eye in the connective tissues there becoming sticky and gelatinous or gummy in appearance, and shown by chemical analysis (*vide* Chemical Report) to be developed in proportion to the duration of the symptoms.

All these symptoms, it will be remembered, are affected by exactly the same factors as those which determine the duration of the period of latency of their development, and recollection of this fact will serve well as the link between the symptoms of acute experimental myxœdema and those of the chronic or cretinic form, which we shall now briefly describe.

(B) Chronic Experimental Myxœdema or Cretinism.

7. *Mode of Artificial Production, and Symptomatology.*

The influence of heat upon the myxœdematous state asserted by one observer (Horsley) has been questioned by Munk, who states that in his series two monkeys were surviving four months after extirpation of the thyroid, and not by the aid of extra warmth.*

The action of heat in greatly affecting the prefatory nervous symptoms has already been alluded to, and it remains now to examine the statements upon which the belief rests that in the monkey the external temperature is capable of altering definitely the symptoms consequent upon removal of the gland.

The method employed (Horsley) was to take five monkeys in whom the thyroid gland had been completely removed, and to place these animals at a temperature averaging 90° F., either immediately after the operation or directly they exhibited the premonitory tremor.

The result was that the average duration of the life of the animal was extended to 125 days† instead of 24 days, as in the case of those left in the ordinary temperature and which exhibited the acute form of the cachexia.

The most important change, however, which these former animals showed was that of great diminution of the ordinary symptoms described on p. 81, the non-development of mucinous degeneration, and the substitution instead of marasmus,

* Munk states that his animals have been kept at 18° C. (64.4° F.) with great variations on either side of this point.

† The extremes being 98 and 184 days.

while the mental disturbance became the most prominent feature among the special symptoms. The animals in all the four cases resembled cretins in every particular, indeed so closely as not to need a very fully detailed description.

It seemed as if the animal had been enabled to pass through (1) a neurotic and (2) a myxœdematous stage into (3) a marasmic and cretinic one.

The course of the symptoms may be thus briefly noted:

The first few weeks were characterised by slight attacks of tremor and malaise. Gradually the intellect became duller, the energy of the animal diminished, and apathy, alternating with idiotic activity, resulted. The constant position assumed was exactly that of a human idiot or cretin. The general degeneration was very conspicuous by persistent paresis, and the attitude consequent upon this state was very characteristic. During the first two thirds of this state of existence the animal usually fed voraciously, but nevertheless steadily emaciated, thus usually contrasting with the acute myxœdematous condition. At the same time many of the symptoms given under (A) were found, and some in a more pronounced form. This was especially the case with the hair, which, besides becoming atrophic, often fell out in quantity. A notable feature was the gradual alteration of the voice, which after some months became ultimately a hoarse croak (the recurrent nerves being perfectly normal), and the usual modes of communication of ideas by the voice entirely lost.

The scene was finally closed by coma.

Post-mortem examination of these animals failed to show the mucinous degeneration noted in acute experimental myxœdema, but on the other hand revealed rather fibroid or cirrhotic changes in the tissues. Chemical examination, moreover (*vide* Chemical Report), revealed the same fact. Allusion may be made here to the similar character of the course of the tissue changes in those cases of idiopathic myxœdema and cachexia strumipriva where life is so prolonged that the disease passes fully into the cretinic stage.

8. *Additional Experimental Facts bearing both upon Sections* (A) *and* (B).

It would naturally be expected that direct investigation of the functional activity of the central nervous system in both the acute and chronic forms of experimental myxœdema would reveal gross changes of a negative, *i. e.* degenerative character. Such is the case (Horsley).

Briefly stated they are as follows, the estimation of the change having been made by stimulating respectively the cortex, corona radiata, and spinal cord, while tracings were taken of the resultant muscular contractions.

α. *Cortex.*—The fall of the initial tetanus in the regular cortex curve was under these morbid conditions as sudden as that seen on exciting the corona radiata. Further, in the final stages the tetanus (*i. e.* tonic stage) is soon exhausted, the curve soon approaching the abscissa after the initial rise, although the electrodes were kept in apposition. At the same time this feeble tonus was followed by a few clonic spasms of the usual epileptiform character.

β. *Corona radiata and spinal cord.*—Similarly the customary tetanus evoked by excitation of these parts was soon exhausted, and moreover the tonic spasm was frequently broken by clonic interruptions indicating the condition of dissolution of the centres.

These facts afford clear demonstration of the remarkable degenerative effect of the operation upon the central nervous system, and it is scarcely necessary to add that the highest centres fail first and lose earliest their functional activity, complete and universal loss being the final result of the disease.

Summary and Conclusion.

Comparison of the foregoing facts with the clinical observation of the forms in which the myxœdematous cachexia presents itself in man leads us to conclude that the loss of

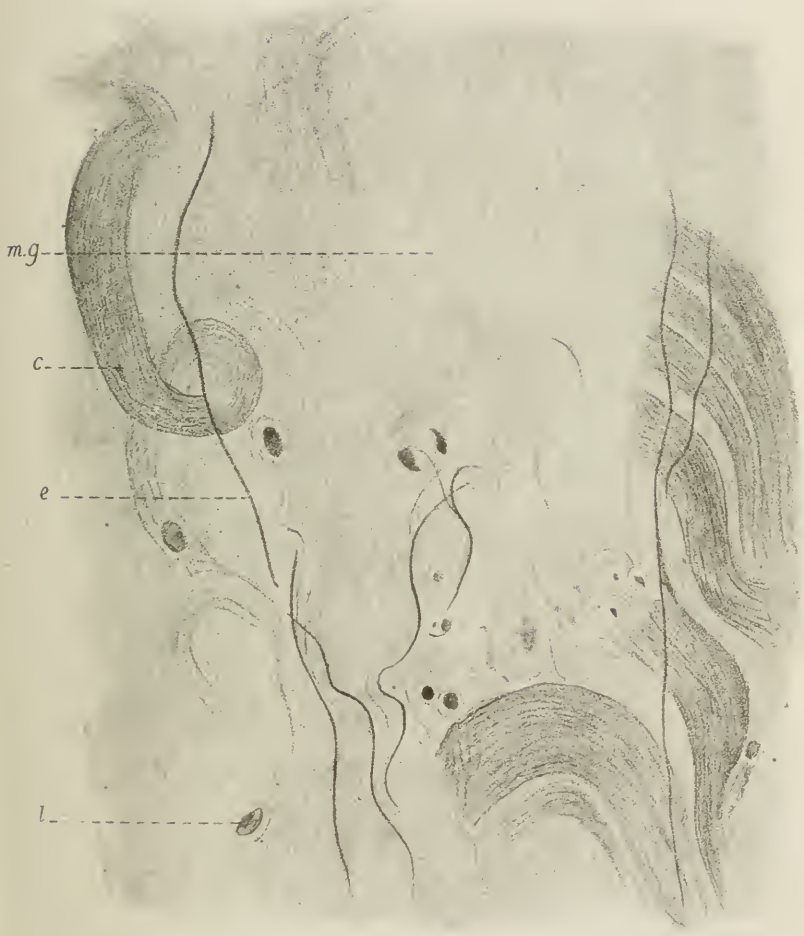
the thyroid gland is the determining factor in the production of the array of symptoms described in the Clinical Report. For the sudden ablation of the thyroid from a normal animal evidently produces in it the myxœdematous cachexia, this varying in intensity according to the importance of the gland to the particular animal the subject of the experiment. If we may form from this evidence a scheme of the pathology of idiopathic myxœdema and cretinism it would result that some as yet unknown condition (possibly of the central nervous system) causes atrophy of the thyroid gland, and consequent upon this are developed the symptoms of cachexia known in its various forms as myxœdema, cretinism, and cachexia strumipriva.

Victor Horsley.

DESCRIPTION OF PLATE IX.

Section of connective tissue from myxœdematous sheep (see pp. 76, 77), showing the mucinoid degeneration of the ground substance, causing separation of the bundles of fibrous tissue. Highly magnified. *c.* Bundle of white fibrous tissue. *e.* Elastic fibres. *l.* Small connective-tissue corpuscle. *mg.* Mucinoid ground substance.

Clinical Society's Report on Myxœdema, Plate IX.



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SECTION VI.

REPORT ON THE RESULTS OF TOTAL AND PARTIAL EXTIRPATION OF THE GOITROUS THYROID GLAND IN MAN.

In 1883 Prof. Dr. Theodor Kocher, of Berne, published in the 19th volume of v. Langenbeck's 'Archiv für Chirurgie' an important paper "On Thyroidectomy and its Sequelæ," in which he described symptoms, in all respects resembling those of myxœdema, which had almost regularly followed in his experience, with but few and remarkable exceptions, total extirpation of the thyroid gland. His own description of these symptoms is as follows:

"As a rule, the patients operated upon begin to complain shortly after they have been dismissed from the hospital—in a few cases, however, after a lapse of four or five months—of lassitude, and more especially of weakness and heaviness in the limbs. In many cases these sensations of weakness are preceded by real pains and dragging sensations in the arms and legs, often in the arms only. Also pains in the neck, shoulders, and abdomen are complained of.

"Soon a feeling of coldness in the extremities, not of numbness but of chilliness, is superadded, and in the winter hands and feet swell and become bluish red, cold, and covered with chilblains.

"The mental activity decreases. This becomes especially obvious in children who still go to school, by their losing their position, and by the teachers observing a constantly increasing diminution of their mental faculties. This diminu-

tion is especially manifested by slowness of thought. The affected individuals have to think a while and to consider longer than usual until they reply. Children who were amongst the best pupils gradually became so much reduced in their mental powers that the teachers were forced to give up their special interest in them. The weakness became especially manifest in the arithmetical lessons.

"Gradually, to the slowness of thought slowness of speech and of other movements is being added. The slow speech surprised us in almost all the individuals who presented themselves for renewal of the examination. The slowness and heaviness in working had, as a natural consequence, that servants who formerly had enjoyed the special favour of their employers because they were industrious men or clever girls, gradually got disliked and had to leave their situations.

"Most of the patients are by no means unaware that their working power and ability had decreased,—quite to the contrary. Some who felt that they were conspicuous by their slow speech and slow thoughts became remarkably taciturn and reticent; others complained to their mothers that they were no longer proficient in school, that they were no longer like other children, and were different to what they had been before the operation. One female patient stated that she often got very angry with herself for not being able to find a reply more quickly and for speaking so slowly.

"With the occurrence of the fatigue and hebetude of thoughts and movements swellings also occur, in some cases at first vacillating, in the shape of tumefactions of the face, the hands, the feet, lasting only a few hours and then disappearing. Repeatedly it is stated that the tumefaction was particularly conspicuous in the mornings. It is most noticeable in the lids, and in several instances the relatives stated that a sac-like tumefaction of the lower lids had been observed. In one case the œdematous swellings of the lids, hands, and feet only occurred in a more pronounced degree after longer intervals, and the patient suffered during these periods from grave respiratory difficulties which were equally absent during the intervals.

"In the majority of cases the tumefaction occurs in a permanent form in the shape of broadening of the features of the face. Next to the hebetude of movements it is especially this broadening which gives to the patient's more remote acquaintances the impression that he has become an idiot. The whole face is thickened, there is a transparent swelling of the lids, such as is seen in certain cases of nephritis, the nose becomes thick, the lips are enlarged and coarse. Also the hands and feet appear coarser and thicker; in rare cases there is œdema of the calves and ankles.

"The trunk, too, becomes amplified; this is especially noticeable in girls in the neighbourhood of the waist. The lower part of the thorax appears widened, the abdomen large. Only in the rarest of cases is this largeness due to demonstrable ascites. We could ascertain the presence of the latter in two cases only, in which there was at the same time obvious œdema of the legs.

"The skin shows a change connected with the tumefaction of certain parts of the body. As in cases in which œdematous swellings have existed it becomes slightly infiltrated, its suppleness is lost, it can only be raised in thicker folds. Its surface is dry; there is often very conspicuous peeling from the cheeks and ears. In connection with these epidermic changes there is falling off of the hair on the head, which was, especially in two cases, very much marked; the hair only scantily surrounds the top of the head, it is thinner and less supple than under normal circumstances. The baldness considerably contributes towards the cretinoid appearance of the affected individuals, inasmuch as the body seems to belong to a child, the head to an old man.

"Very great anæmia is observed in the more advanced cases. The skin and mucous membrane, especially of ears and lips, are pale; the pulse remarkably small, sometimes thready, easily compressible." (Here follows a description of the minute changes observed in the blood, the reproduction of which is not required for the present purpose.)

"In those cases in which the patients at the time of the operation were still in the period of active growth of the body,

the development in length of the body got arrested in a very remarkable manner."

Professor Kocher then proceeds to enumerate some rarer symptoms, such as difficulty of swallowing, retching, giddiness, fainting fits, headaches, spasms, epileptic attacks, stiffness of joints, almost paralytic conditions, &c., and to state, on the other hand, that, with a few quite isolated exceptions, no pulmonary, laryngeal, coarse cardiac, or ophthalmoscopic changes (besides smallness of the ocular arteries) were found. He concludes his description as follows :

"If we are now to give a name to the described complex of symptoms, its relationship to idiotism and cretinism is obvious; the arrest of development, the large head, the thick nose, the enlarged lips, the coarse body, the hebetude of thought and speech whilst the muscular power is strong, undoubtedly point to a relationship between the two affections. It is interesting that, as often insisted upon by the relatives, the individuals are not stupid in the true sense of the word,—they are quite conscious of the regression of their mental powers, especially of the slowness of conception, consideration, and articulation. They feel that they have much more trouble in advancing their knowledge, and one of our patients attempted by redoubled industry to keep pace with her fellow-pupils.

"We prefer to give to the array of symptoms for the present an absolutely plain name. To the disturbances of nutrition accompanying the disappearance of goitres after the use of iodine preparations (Virchow) the name of goitrous cachexia with the addition of the word 'jodica' has been given; we see no difficulty in using provisionally the term cachexia strumipriva."

So far Professor Kocher. The peculiar cachexia, more or less developed, was observed in all the eighteen cases of total extirpation which he had the opportunity of personally examining some time after the operation, save in two.* But it is a

* In his paper Prof. Kocher gives exact details concerning the total number of his operations, their immediate results, the patients whose further fate could not be traced, and those who only sent reports in writing and did not present themselves for re-examination, &c. The reader interested in these details must

most remarkable circumstance that in one of these cases a small part of the gland had been inadvertently left behind and had increased after the operation to the size of a pigeon's egg, whilst in the other case an accessory thyroid gland, first observed three months after the operation, had undergone some hypertrophy. Again, not one of twenty-eight patients, on whom partial thyroidectomy had been performed, and whom Professor Kocher personally examined some time after operation, showed any symptoms of the cachexia. A connection, therefore, between the latter and the total loss of the thyroid gland obviously appeared to result from Professor Kocher's experiences.*

In pursuance of this question, the following circular was sent, in February, 1887, to all surgeons, who were known to have performed total or partial extirpation of the thyroid gland in man :

Dear Sir,

Two years ago, the Clinical Society of London appointed a Committee to inquire into the nature of the disease called "Myxœdema."

The grounds on which this Committee was appointed were :—(1) The propriety of investigating the disease on general grounds; (2) the important publication made by Prof. Kocher, of Berne, in which symptoms in all respects resembling those of myxœdema had followed extirpation of the thyroid gland.

The Committee has now completed its work so far as concerns the general ætiology, symptoms, and morbid anatomy of the disease; but the question raised by Prof. Kocher's observations and by similar experience of other continental surgeons, calls for further and special inquiry.

It may be stated that the result of the Committee's investigation tends to show, that the most constant, if not the only constant, change found after

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be referred to the original, it being here only intended to give a broad outline of the development of the question.

* Considering that Prof. Reverdin communicated his own experiences concerning the more remote consequences of total extirpation of the goitrous thyroid gland, which are practically identical with those of Kocher, to the Medical Society of Geneva in September, 1882, *i. e.* seven months before Kocher's paper was read before the congress of German surgeons (April, 1883), we think it right to state here expressly that the reproduction of Kocher's description in the present report has been decided upon for the sole reason that it was the communication of *his* and of Bruns' observations to the Clinical Society of London, as mentioned in the historical introduction to the present report, which formed the starting-point of our investigations.

death in cases of myxœdema is atrophy or morbid destruction of the thyroid gland.

It follows that a comparison of two sets of observations, the one purely pathological, the other in a sense experimental, must be instituted; and that the Committee should obtain all available information respecting the influence upon the general system exerted by ablation of the thyroid gland.

The Committee has therefore entrusted to me the duty of communicating with my colleagues in various parts of Europe, who may have had opportunities of observing the effects of removal of the thyroid body. I now venture to address myself to you on this point, trusting to your kindness for a speedy answer.

The questions which I should propose are:

1. Have the symptoms of "cachexia strumipriva" (Kocher) or "myxœdème opératoire" (Reverdin) followed in your experience removal of the thyroid gland? Will you state whether invariably, in part, or not at all?

2. In the cases which have come under your observation, can you kindly state the number of complete extirpations, and of partial extirpations?

3. Can you, having regard to the point named under 2, give the Committee information as to the relative effects of total, and of partial, removal of the gland?

It is obviously of great importance in relation to these points that a definite statement as to the removal of the thyroid gland, whether certainly complete or incomplete, and as to the existence of presumably accessory thyroid bodies, should be afforded.

To facilitate comparison, a brief account is given on the next page of the symptoms of myxœdema as observed in England, together with a photograph of a typical case of the malady.

I am, dear Sir,
Yours truly,
DR. FELIX SEMON.

39, WIMPOLE STREET, LONDON, W.;
February, 1887.

Of this circular 115 copies altogether were sent out, of which 23 were addressed to British and Irish, 8 to Austrian, 30 to German, 11 to French, 3 to Belgian, 1 to a Dutch, 23 to Swiss, 2 to Italian, 2 to Danish, 4 to Swedish and Norwegian, 6 to Russian and Polish, and 2 to Australian surgeons.

The names of these surgeons were ascertained from many literary sources, amongst which may be specially mentioned, as mostly bearing upon the question at issue:

(*a*) *Liebrecht*, "De l'excision du goître parenchymateux" ('Bulletin de l'Académie Royale de Médecine de Belgique,' 1883, vol. xiii, Nos. 3 and 4).

(*b*) *Jankowski,* "Kehlkopflähmungen nach Kropfexstirpation" ('Deutsche Zeitschrift für Chirurgie,' vol. xxii, 1885).

(*c*) *Bourneville et Bricon,* "De l'idiotie, compliquée de cachexie pachydermique" ('Archives de Neurologie,' vol. xii, September, 1886).

(*d*) *Schill,* "Neue Arbeiten über Kropf und dessen operative Behandlung" ('Schmidt's Jahrbücher,' 1886, Nos. 5 and 6).

(*e*) 'Internationales Centralblatt für Laryngologie, Rhinologie, und verwandte Wissenschaften,' 1884–87.

We have to express our obligation to the editors of the following medical journals for having either reprinted our circular in their columns, or recommended, in editorial articles, their readers to assist us in the inquiry: 'The Lancet,' 'The British Medical Journal,' 'Le Progrès Médical,' 'La Revue de Chirurgie,' 'Berliner klinische Wochenschrift,' 'Deutsche medicinische Wochenschrift,' 'Münchener medicinische Wochenschrift,' 'Centralblatt für Chirurgie,' 'Wiener medicinische Wochenschrift,' 'Correspondenzblatt für Schweizer Aerzte.'

In reply to the 115 circulars sent out, altogether 69 communications have been received, of which number 16 were sent by British, 6 by Austrian, 20 by German, 2 by French, 2 by Belgian, 1 by a Dutch, 13 by Swiss, 1 by an Italian, 2 by Danish, 3 by Swedish and Norwegian, 3 by Russian surgeons. Four circulars did not reach their destination, because the exact address of the addressee could not be given, and were returned by the Post Office; several replies were merely to the effect that the addressee had no personal experience to offer; again, in a few instances, different observers sent replies referring to one and the same case.

Thus, on the whole 64 communications only could be utilized. These, however, very considerably varied in character. Whilst some of our correspondents strictly adhered in their replies to the questions laid before them, others gave us only briefly their general results, and again, others were good enough to communicate their experiences at length, to send us tables giving particulars of their cases, or even full descriptions of operative and other details, not necessarily bearing upon the question

at issue. Whilst cordially thanking them all, we have found it impossible to give, in a report like the present, all details and conclusions in the authors' own words.

It had been intended to arrange the results of this part of our inquiry simply in a tabular form; but this, again, has been found impracticable in consequence of the heterogeneous character of our material; and we have finally decided to extract from the letters kindly sent to us all the facts directly bearing upon our questions, and such opinions only as appeared to demand further investigation. To facilitate the study of the question, we propose to give in the first place a general survey of the results of *total* extirpation of the goitrous thyroid gland as illustrated by the replies of our correspondents and by reports of other observers, previously given in print. A similar survey will then be given of the cases of partial extirpation or resection of the gland accessible to us, and of their results. Finally, it will be investigated, whether the facts at present at our disposal justify us in drawing any certain conclusions as to the remote results of thyroidectomy, and to their connection with myxœdema. In this part will also be found some tables giving the general results of different observers.

The principle observed in the following report is this, that the replies of observers belonging to the same nation have been grouped together, and that with regard to the precedence of nations as well as to the succession of authors within each group alphabetical order has been followed.

A. Results of Total Extirpation of the Goitrous Thyroid Gland.

I. *Austria.*

1. Prof. Billroth (Vienna) informed us that he had requested Prof. Wölfler, of Graz, to communicate to us the results of the extirpations performed in his own clinique. These results will be found under Heading 6, p. 99.

2. Prof. Gussenbauer (Prague) has performed between October, 1878, and December, 1886, fourteen total extirpations in cases of benign goitre, and three total extirpations in cases of carcinomatous goitre. One of the latter died thirty-six hours after operation from cardiac syncope. The post-mortem examination showed general marasmus. The two other patients suffering from carcinoma of the thyroid were dismissed, temporarily cured. One of them (a man) has not since been heard of. The other patient, also a male, was repeatedly seen afterwards. Apart from slight œdema of the eyelids and of the skin of the neck no disturbances of general health were noted. He died four years after operation at his home from repeated tracheal hæmorrhage.

Of the 14 total extirpations performed in cases of benign goitre 5 cases (3 men, 2 women) could not be followed up after dismissal from the hospital; 4 patients remained perfectly well after dismissal. The remaining 5 patients (2 males, 3 females) were also dismissed cured. The following particulars, however, were subsequently ascertained concerning them:

a. Male, æt. 24. Fibrocystic, multilocular goitre of the size of a child's head. Operation on February 3rd, 1879. Cured five weeks later. Report on January 1st, 1884:—"The patient is very pale up to the present. His lips and eyelids have been temporarily swollen. The respiratory difficulties, from which he suffered before the operation, have disappeared; the voice is, as formerly, a little husky." Report on September, 1884:—"The patient suffers from frequent headache and giddiness, as well as from disagreeable dryness in the throat. The mental functions are not impaired; the patient is able to work again."

b. Girl, æt. 10. Vascular goitre of the size of an apple. Operation on August 25th, 1881. Cured after eighteen days. Clinical demonstration on August 17th, 1884:—"The girl is well developed, has not yet menstruated, very pale. Heart action accelerated, pulse small, skin dry. The patient has frequently suffered during the first year after operation from drawing pains and weakness in the lower limbs. Her mother has observed a very marked coming off of her hair. The lids and

lips are stated to have been at times swollen. The patient goes to school, and is stated to be industrious."

c. Boy, æt. 9. Parenchymatous, very vascular goitre of the size of an apple. Operation on May 9th, 1882. Dismissed cured on May 26th, 1882. Report of September 24th, 1884:—"The boy is much weaker than before the operation. He is chlorotic, easily tired after walking, has had several attacks of giddiness, and repeatedly spasmodic pains in his feet. The lower lip and the eyelids are temporarily swollen. The movements of the limbs are heavy: the appetite is small."

d. Girl, æt. 17. Colloid cyst of the size of a child's head. After five weeks' treatment by means of iodoform ointment diminution to the size of a man's fist. Transferred to the medical side on account of sudden rigor, enlargement of the spleen, and diarrhœa, followed by intense icterus. Seven weeks later, after complete recovery, extirpation of the goitre on January 17th, 1883. Dismissed cured on February 21st, 1883. Report of September 26th, 1884:—"The feet are swollen, the gait is slow. Now and then spasms occur, followed by loss of consciousness, after which for a long time weakness and heaviness remain in the limbs. The memory is greatly impaired. The patient feels continually ill."

e. Woman, æt. 34. Fibro-parenchymatous goitre of more than a child's head size. Operation on May 9th, 1884. Dismissed June 13th, 1884, a ridge of the wound superficially granulating. Status on November 1st, 1884:—"The patient is paler and somewhat emaciated. Eyelids and hands slightly œdematous. Voice somewhat hoarse, although laryngoscopic examination shows no abnormality, and though the vocal cords come completely together in phonation. Subjectively the patient feels quite well, and is remarkably lively." [Most of Prof. Gussenbauer's cases have been published *in extenso* by Dr. Pietrzikowski, 'Prager med. Wochenschrift,' No. 48, *et seq.*, 1884].

3. Prof. Hofmokl (Vienna) has performed one total extirpation of the thyroid gland in the case of a woman. The patient recovered, but has not since been heard of.

4. Dr. Kraus (Schaessburg, Hungary) has entirely removed

a very large goitre from a man, without any symptoms of myxœdema having occurred up to the time of his communication, *i. e.* ten to twelve years after operation. Dr. Kraus feels certain that he removed the entire gland, and that no accessory glands were present.

5. Prof. von Mosetig-Moorhof (Vienna) has performed 4 total extirpations. In one case the patient died suddenly sixteen hours after operation from embolism of the Sylvian artery. The remaining 3 patients were cured, at no period showed any disturbance of general health, and remained perfectly well. One of these patients, a girl æt. 19, was seen five years after operation, when her state of health was found to be excellent.

6. Prof. Wölfler's (Graz) remarks concerning Prof. Billroth's experiences (*vide* sub 1) are so important from more than one point of view that they are here *verbatim* translated.

"The following communications," he says, "refer to experiences from 102 goitre extirpations, performed between 1877 and 1884 in Billroth's clinique. Amongst these there were 46 total extirpations, and these only will be spoken of in the following lines. Of these 46 cases 6 terminated fatally in consequence of the operation. Of the remaining 40 patients 25 reported about their state of health after operation; most of them put in a personal appearance. Concerning these 25 patients, the last inquiries after whom were made in April, 1886, the following report may be given :—Three of them died later on, 2 from tetany, 1 from pulmonary tuberculosis. Of the remaining 22 patients 1 suffers from tetany, 1 from tuberculosis, and 2 suffer from conditions which resemble slight symptoms of cachexia strumipriva.

a. One patient was at the time of operation (October, 1881) twenty-three years old. Three years later he complains of fatigue and weakness in the legs; he states that he cannot do his work as well as formerly, and that he feels no longer up to the mark. His hair has not come off, and no further symptoms of myxœdema are present.

b. Another patient a female æt. 46, operated upon on December 6th, 1883, complains eight months after the total

extirpation of feeling cold, and of heaviness in arms and legs, want of appetite, and watery secretion from the mouth. No other troubles are present.

The remaining 18 patients are quite well, and suffer neither from tetany nor from cachexia strumipriva. The satisfactory state of health of these patients was elicited :

I. In 1 patient, female, æt. 35, six years after operation. Recurrence of the goitre.
II. In 3 patients, five years after operation.
  α. Young lady, æt. 20. No recurrence.
  β. Man, æt. 28. No recurrence.
  γ. Boy, æt. 15. Recurrence.
III. In 2 patients, four years after operation.
  α. Girl, æt. 26. No recurrence.
  β. Married woman, æt. 20. Recurrence.
IV. In 4 patients, three years after operation.
  α. Married woman, æt. 21. Recurrence.
  β. Married woman, æt. 42. No recurrence.
  γ. Married woman, æt. 28. Recurrence.
  δ. Married woman, æt. 37. Recurrence.
V. In 4 patients, two years after operation.
  α. Boy, æt. 16. No recurrence.
  β. Boy, æt. 19. ? Recurrence.
  γ. Married woman, æt. 37. ? Recurrence.
  δ. Married woman, æt. 35. No recurrence.
VI. In 4 patients, one year after operation.
  α. Girl, æt. 17. No recurrence.
  β. Married woman, æt. 36. No recurrence.
  γ. Boy, æt. 17. No recurrence.
  δ. Married woman, æt. 37. Recurrence.

So far Prof. Wölfler's report. [The remarkable fact that at least in 7, if not in 9, out of 18 cases, in which "total" extirpation of the goitre is stated to have been performed, "recurrence" took place, will be dwelt upon further on.]

II. *Belgium.*

7. Dr. Deschamps (Liège) has performed one total extirpation in a girl, æt. 20. The case is described in the 'Annales de la Société Médico-Chirurgicale de Liège,' 1886. Ten months after operation no symptoms of myxœdema.

8. Dr. Hicguet (Liège) has performed 4 total extirpations. One patient succumbed to tetany, another to hæmorrhage eighteen days after the operation. Of the 2 remaining patients who were cured, one, a girl æt. 7, had only been operated upon one month ago at the time of the communication (April 4th, 1887). This girl suffered for three days—it is not stated whether *immediately* after the operation—from a "hard" œdema ("œdème dur") of the face and neck, which, however, had disappeared six days afterwards. The last patient, a married woman æt. 36, was operated upon on account of a very large cysto-parenchymatous goitre in October, 1881. There were never any symptoms of cachexia, and the patient enjoys at present most perfect health.

III. *Denmark.*

9. Prof. Studsgaard (Copenhagen) has performed 4 total extirpations, after 1 of which cachexia strumipriva followed. "The patient, a female, died comatose about two years after the appearance of first symptoms of the cachexia, which ran a typical course. I cannot give particulars on the condition of the urine; the patient died, not in the hospital, being under the care of another practitioner." In all total operations performed by Prof. Studsgaard every part of glandular tissue which came into view was removed, it having always been found in a state of degeneration. Prof. Studsgaard adds, however, that since he has become acquainted with the papers of Prof. Kocher and of other German authors he has performed no more total extirpations, even not in cases in which all parts of the gland were enlarged. In such cases he has only removed the larger nodes and thus relieved the pressure-phenomena.

IV. *France.*

10. Prof. Poncet (Lyons) has performed 5 total extirpations, 2 of which were followed by death, which resulted in one case from traumatic shock, and the cause of which is not stated in the other case. (The two fatal cases have been published in Dr. Boyer's 'Thesis,' Lyons, 1884, in which also several of the successful total and partial operations, performed by Prof. Poncet and referred to hereafter, have been described.) Of the 3 remaining operations 1 was performed on a lad æt. 17, on May 20th, 1886. On July 7th, 1887, the patient was seen again. He was in full enjoyment of his mental faculties and in excellent bodily health, and had considerably grown since the operation. No accessory thyroids were observed at the time of the operation, and no tumour in the neck which could have been interpreted as an accessory thyroid, having undergone compensatory hypertrophy, was visible when the patient was re-examined fourteen months after operation. Equally satisfactory results were noted eight months after operation in another case of Prof. Poncet's, in which total thyroidectomy had been performed on November 7th, 1886, on a woman, æt. 23. In the remaining case, in which an enormously hypertrophied thyroid was removed *in toto* from a man æt. 27, on February 17th, 1885, it has been impossible to find out the whereabouts of the patient, who made a very good recovery.

V. *Germany.*

11. Prof. Bardeleben (Berlin) states that in not one of the 15 total extirpations performed by him since 1876 symptoms of cachexia strumipriva have followed. The operations were with certainty to be classed as "complete" extirpations; accessory thyroid glands were, in spite of careful investigation, not detected in a single instance. Five of the cases terminated fatally (amongst them were two cases of malignant disease of the thyroid). "The remaining 10 patients from whom the

gland had been extirpated *in toto* could, with two exceptions, be observed at least one to two years, some up to the present, three to four years, after, without having in the least shown signs of mental or bodily degeneration or the well-known array of symptoms of cachexia strumipriva, cachexie pachydermique, myxœdema." [This last sentence is quoted from Staff-Surgeon Dr. Koehler's "Mittheilungen aus der chirurgischen Klinik des Herrn Geh. Rath. Bardeleben," published in 'Deutsche Zeitschrift für Chirurgie,' 1887, in which Prof. Bardeleben's cases are described in detail, and to which the last-named author had referred us for particulars.]

12. Dr. Baumgärtner (Baden-Baden), who was good enough to accompany his statements by some very instructive photographs (see Pl. X, figs. 1 and 2) illustrating the appearance of several of his patients before and at different times after operation, writes as follows:

"In reply to your first question I beg to say that the phenomena or symptoms of cachexia strumipriva corresponded exactly to those of myxœdema, and that they occurred only, but only sometimes, after total extirpation of the thyroid gland. In reply to your second and third questions I have to state that my observations are founded upon 12 total and some 20 partial extirpations. The 12 total extirpations, performed mostly in cases of circular goitres, can be termed with absolute certainty as complete, the existence of accessory glands being excluded. Of these 12 total extirpations in 5 cases more or less marked symptoms of cachexia strumipriva occurred within one year after operation, whilst 6 patients remained perfectly free from the dreaded symptoms. The particulars of these 11 cases may be found in 'Langenbeck's Archiv.,' vol. xxxi, Heft i, and in the 'Deutsche medicinische Wochenschrift,' No. 50, 1886. The twelth total excision, being the seventh in which no cachexia followed, has only been performed three quarters of a year ago, so that the critical first year has not yet been entirely passed. This case has not yet been published. The result of the operation, performed on account of most violent dyspnœa, on a woman æt. 58, was very satisfactory. . . . The patient was dismissed, breathing

noiselessly, four weeks after the operation, and is at present quite free from cachectic symptoms.

"The signs of cachexia strumipriva show themselves already within the first month after operation; if they have not developed after the lapse of one year they will not occur at all, and the patient will be certain to remain free from the dreaded phenomena.

"In severe cases (of which class I have observed three) the symptoms increase from year to year, the mental and psychical hebetude, the puffy, hyperæmic appearance, the general exhaustion, increase and lead to the fatal end (once in my cases).

"Not every cachexia strumipriva, however, runs such a course; it may remain stationary in a low stage of its development (once within my observation), or even show a considerable improvement concerning individual symptoms, especially those of the intellectual sphere (once observed by me), so that resumption of work and ability of gaining a living become possible again after having been, to say the least, for some time very doubtful. The puffiness of hands and feet, also of the face, appears to remain the most persistent symptom even in the event of an improvement.

"The six patients on whom total extirpation has been performed, and in whom cachexia strumipriva has not occurred, have remained, so far as their observation during several years appeared to show, perfectly healthy; not a trace of fresh growth of a thyroid gland has been noted, and they must be looked upon in physical as well as in mental respects as thoroughly normal persons; some of them have even considerably improved in intelligence, at least in intellectual appearance."

Concerning the etiology of the cachexia Dr. Baumgärtner has given up his former theory of its being due to chronic asphyxia, and is now inclined to believe that it results from disease of the centres of the sympathetic nerve caused by mechanical and chemical injuries during and after operation. Details concerning this point will be found in his last paper on the subject, published in the 'Deutsche medicinische Wochenschrift,' No. 50, 1886.

13. Prof. Paul Bruns (Tübingen) refers in his answer to 3 cases of total extirpation, which he had the opportunity of examining some time after the operation, and which he has described in full in his paper: "Ueber den gegenwärtigen Stand der Kropfbehandlung" ('Volkmann's Sammlung klinischer Vorträge,' No. 244, 1884). Of these 3 cases, in one, that of a woman æt. 26, no changes resembling those of myxœdema were observed; the operation, however, had at the time of the re-examination only been performed four months previously. In the second case, that of a man æt. 24, who was re-examined six months after operation, and in the third case, that of a girl æt. 23, on the other hand, the symptoms of cachexia strumipriva were well developed. In both cases they had made their appearance one to two months after operation. The description of the last-named case reads like one of typical primary myxœdema. In addition to these 3 cases Prof. Bruns describes in his paper that most interesting case of Dr. Sick's (of Stuttgart), which he had, so to say, discovered, eighteen years after total extirpation of a goitre, and in which the symptoms of true cretinism were completely blended with those of myxœdema. As the communication of this particular case to the Clinical Society of London, at the meeting of October 24th, 1884, resulted in the establishment of the present section of our inquiry, it seems but right to report it here again, and to add to it the result of the post-mortem examination, the patient having died shortly after the publication of Prof. Bruns' paper.

The patient at the time of the operation (1866) was ten years old. Half a year after the removal of the goitrous thyroid the operator, Dr. Sick, when publishing the case in the 'Württemberg. med. Correspondenzblatt,' No. 25, 1867, drew attention to the fact that a marked psychical change had taken place in the boy; he had become unusually quiet and retired, having previously been a bright and lively child. Prof. Bruns' attention having become attracted by this note at the time when Kocher's publication stimulated further investigation, he in 1884 instituted inquiries after the patient and he was detected still living in his paternal village. But

he had become a dwarfy cretin! The development in length of the trunk and limbs had entirely become arrested since the operation, and only the dimensions of the head were those of a man of his age. The total length of the body was five feet two inches, *i. e.* the average length of a boy ten years old. The expression of the face was that of an idiot, the whole face was much swollen, especially the lips and lower eyelids; the skin and visible mucous membranes were pale. The skin of the whole body was dry, brittle, thickened by a peculiar soft, gelatinous infiltration; the hair was very scarce and thin on the head; there was no trace of a beard, and but few hairs about the pubes, whilst the genitals were well developed. Speech was slow, this being obviously due to swelling of the tongue, palate, and tonsils. The thyroid gland was entirely absent, the scar of the operation being visible and movable. The larynx and trachea were normal; respiration was free and easy, the heart's action weak. There was no swelling of the spleen; the number of white blood-corpuscles was not increased. Sensibility and general muscular power were well preserved, but the patient could not do any work and hardly walk fifty steps. The incapability of action had only within the last few years become quite complete, for when he left school at the age of fourteen, he could and did, though incapable of learning a trade or work in the fields, still industriously do knitting work. Some years later, however, he became incapable even of this kind of work. There was also marked intellectual trouble. Whilst the boy had been before, and immediately after, the operation one of the best pupils in his school, his mental faculties were now much less developed than those of a boy ten years old; his faculty of thinking was very weak and slow; his replies to very simple questions correct, but very slow; his behaviour was always equally serious, and not in the least affected or grotesque; his visual and auditory powers had, according to the reports, markedly decreased.

Very shortly after the publication of Prof. Bruns' report, the patient, who had been received into his Clinique at Tübingen, in order to be more closely observed, died suddenly

(August 13th, 1884) during an attack of unconsciousness, and arrest of respiration. The fatal attack was preceded two hours previously by a similar one, from which the patient recovered.

From the report of the very thorough post-mortem examination (Dr. Nauwerk) we abstract the following particulars, which are of direct interest in connection with the purpose of the present inquiry. [For further details concerning the clinical history of this patient, and the results of the autopsy, as well as the other cases of cachexia strumipriva observed by Prof. Bruns, we refer to the careful contribution, "Zur Cachexia Strumipriva," made by his former assistant, Dr. Grundler, in the 'Mittheilungen aus der chirurgischen Klinik zu Tübingen,' vol. i, 1884, p. 420, *et. seq.* Tübingen bei H. Laupp.]

". . . The whole body shows about the appearance generally seen in moderate degrees of general hydrops; the tumefaction of the soft parts, however, is so distributed that the upper and lower extremities appear equally bulky, whilst the head shows the greatest amount of thickening of the soft parts, whereby it assumes a characteristic, cretinoid appearance. . .

"In the skin of the thorax and abdomen no important change can be recognised, the subcutaneous fatty tissue very abundantly developed, moderately œdematous. Thoracic muscles moist, very pale, almost grey. Subserous abdominal fat very abundantly developed. In the abdomen about 100 grammes of a yellow, only very slightly opaque, fluid. Also between the muscles plenty of fat. . . . Mesentery and omentum rich in fat. . . . Abundant mediastinal fat. . . .

"Very large tongue, shows in various places impressions, caused by the teeth, in part with recent small hæmorrhages; no deeper scars. Uvula and palatine arches swollen, moist, injected. Tonsils enlarged, the right pale, the left more greyish violet, appearance of chronic hyperplasia. . . .

"No trace of goitre or thyroid tissue. . . .

". . . . The tumefaction of the scalp is mostly due to abundant œdematous fat. . . .

". . . . The external configuration of the brain does not show, so far as the sulci and convolutions are concerned,

anything remarkable. The convolutions are, on the whole, somewhat atrophic, so that the sulci are distinctly marked. Much developed hydrops of the meninges. Moderate injection of the pia mater. The arachnoid lustrous, at the same time showing diffuse tendinous thickening, especially along the longitudinal fissure over the central portion of the brain; besides especially over the frontal lobes numerous, miliary to pin's-head sized, in part confluent, tendinous tumefactions of the pia mater are found, as well within the sulci as on the convexity of the convolutions.

"Lateral ventricles not much dilated. Substance of the brain soft, containing less blood than usually, otherwise not noticeably changed. Weight of brain, with pia mater, after opening of the ventricles = 1435 grammes. Basal ganglia corpora quadrigemina, &c., not changed. Configuration normal.

"Strongly developed testicles, containing plenty of blood. Prostate and seminal vesicles normally developed.

"The right humerus, which was removed from the body, showed normal configuration. *The border of the epiphysis mostly still recognisable.* Also that on the proximal end of the femur is still very distinct. The epiphysis of the trochanter major is still cartilaginous." (Nothing of importance in the thoracic and abdominal organs.)

The microscopic examination of numerous organs, made by Dr. Nauwerk, yielded the following results:

"1. *Blood.*—So far as an opinion can be formed from the blood of a dead body, no abnormality exists; the red blood-corpuscles are of the usual size and of normal colour; the leucocytes are not augmented in number.

"2. *Muscles* of the trunk and extremities not changed; no connective-tissue hyperplasia.

"3. The *muscles of the tongue* show no abnormal conditions; there is no hypertrophy of the muscular fibres, but abundant interstitial fatty tissue.

"4. The *skin*, specimens of which, obtained from different parts of the body (head, trunk, limbs, scrotum), were examined, shows, apart *from abundant development of the panniculus*

adiposus, and from slight œdematous transudation, nothing particular; no connective-tissue hyperplasia or changes in the nerve-terminals can be made out, and just as little mucinoid degeneration even after treatment with acetic acid.

"5. The *sympathetic* as well as the peripheral nerves show normal features.

"6. *Spleen, liver, kidney* without connective-tissue proliferation. In the liver only a marked *infiltration* of the hepatic cells, especially in the central portions of the lobuli, caused by yellow-brownish *pigment-granules*, and often in connection with a deposit of fat, attracts attention.

"7. The *brain*, examined both fresh and hardened, shows the usual signs of *chronic lepto-meningitis* with moderate participation of the *cortex*. The tissue of the subarachnoid, especially, however, of the pia, appears considerably but unequally thickened, its fibres coarser than normal, not rarely infiltrated with pigment-granules, and very rich in nuclei. The peripheral portions of the cortex, too, are in parts, especially around the vessels, abnormally rich in nuclei; the perivascular lymphatic spaces are in many places dilated and contain sometimes fat-globules. In the recent specimen the cortical vessels when picked out were frequently seen to be covered with fine fat-droplets."

In his epicritical remarks Dr. Grundler states that the tumefaction of the skin in cases of cachexia strumipriva is merely due to an *abnormally abundant agglomeration of subcutaneous fatty tissue*, which in parts shows some evidence of serous transudation, and that an infiltration of the skin with mucinoid fluid, such as described in cases of myxœdema, could nowhere be found. He is inclined to believe, that cachexia strumipriva is due to a disturbance of the central nervous system, which only occurs when the probable action of the thyroid gland, viz. its participation in effecting tissue change, has been eliminated; and he quotes in support of this view the result of the autopsy of the case just communicated, in which a chronic lepto-meningitis with participation of the cortex was found, and the whole appearance of which, in Prof. Ziegler's opinion, reminded one of certain cases of progressive paralysis.

Prof. Bruns himself adds to the information kindly given the following :—" Besides these cases (viz. those referred to above), another female patient presented herself in whose case I had supposed, on the evidence of the description of the operation, that total extirpation had been performed. She showed no trace of cachexia, but had a goitrous node of the size of an apple, which, according to her statements, had only developed itself *after* the operation, which thus, after all, had not been complete.

" Further experiences I have not been able to collect, because I have, of course, not since performed a single *total* extirpation."

14. Dr. Burckhardt (Stuttgart) has three times (in 1880, 1882, and 1884) performed total thyroidectomy. The patients were all females, two women over forty years old, and one girl a little over twenty. In none of these cases were symptoms of cachexia strumipriva observed. Information with regard to the girl was obtained, so far as the two first years after operation are concerned ; whilst Dr. Burckhardt knows that the two women, who were operated upon in 1882 and 1884, are well up to the present. Since 1884 he has performed no more total extirpations.

15. Dr. Credé (Dresden) has performed 7 total extirpations, in which *nothing* of the gland was left behind. In 4 instances the patients were under twenty. " In not a single case have conditions similar to Kocher's cachexia developed. All the patients have mentally and physically remained perfectly well up to the present day, *i. e.* in part after six years. I have kept all these patients under observation. Altogether 3 died, 1 from tetany, 1 (sixty-eight years old) from pneumonia, 1 (sixty-five years old) from exhaustion, which had already existed before the operation. I have never operated according to Kocher's method, but always got hold of the vessels in closest proximity to the capsule, often left the artery forceps hanging until after the end of the operation, and then ligatured only a few vessels. One total extirpation was performed in a case of Basedow's disease, which disappeared entirely after operation." [Dr. Credé has recorded some of

his experiences *in extenso*, in the 'Beiblatt zum Centralblatt für Chirurgie,' No. 23, 1884.]

16. Prof. Czerny (Heidelberg) writes:—"I am unfortunately unable to reply to your questions concerning the relationship of myxœdema to goitre extirpation on the base of statistics, as I would have to follow up my cases, which would probably demand considerable time. From my beginning I have almost exclusively practised partial extirpation of goitres. The total extirpations which I have performed on account of malignant tumours of the thyroid gland have, without exception, succumbed to recurrence of the disease. It cannot, therefore, be wondered at that I have received in one or two instances only news concerning the occurrence of cachexia, instances which I am going to follow up. On the other hand, I have seen some cases in which, whilst a *degenerated* thyroid gland existed, decided signs of myxœdema were present. Judging from the positive cases, which certainly always prove more than the negative ones, in which after all still physiologically active tissue may have remained behind, I personally make no doubt that myxœdema is a consequence of the total absence of active thyroid gland tissue, and its very occurrence in cases of still existing but totally degenerated thyroid gland seems to me to speak for this view. True, that chronic asphyxia, deficient nutrition, and rickets are associated, and that the picture is hereby considerably modified.

"I have extirpated at Heidelberg, from 1877—1887, 19 innocent and 9 malignant goitres. . . . ." (References to the malignant goitres have been made by Prof. Braun in 'Langenbeck's Archiv,' vol. xxviii, 1883, and to paralyses of the vocal cords after operation by Jankowski, loc. cit., see p. 95).

17. Dr. Eugene Hahn (Berlin) has performed 6 total extirpations. One case was lost from view. In the remaining 5 cases, in 2 frequent headaches, conditions of excitement and fear, with some degree of loss of memory in one of them, were observed; in 1 numbness in some parts of the body (forearm); in 1 twitchings of fingers and muscles of trunk. Accessory thyroid glands were not observed in any of these cases.

18. Dr. Hopmann (Cologne) has performed 6 certainly total extirpations. Two of these have only been made in the course of this year, and therefore cannot be utilised for the present inquiry; so far, however, the patients are quite well. Of the other 4 cases, in 1 the patient, who was suffering from carcinomatous goitre, died twenty-four hours after operation, it having been impossible to preserve the pneumogastric nerve. The remaining 3 patients were all women; 2 of them have kept quite well, the one, who was forty-three years old at the time of the operation, having been seen again ten years after operation, the other, who was thirty-nine years old at the time of the operation, having been seen two years afterwards.

The third case, however, is a very remarkable specimen of cachexia strumipriva, and will be here communicated somewhat more fully, in part in Dr. Hopmann's own words, as it has not been published before.

Mrs. A—, æt. 27, had from her ninth year suffered from a large vascular goitre, involving both lobes, which caused violent dyspnœa on exertion and some dysphagia, a very protracted treatment by means of iodine injections having failed to produce any effects, and paralysis of the left vocal cord having taken place. Dr. Hopmann on July 12th, 1881, extirpated the goitre *in toto*, the removal of the gland having had to be followed immediately by tracheotomy on account of softening and collapse of the trachea. Within the first few days after operation three attacks of unconsciousness, with opisthotonos and general convulsions, occurred, each lasting several minutes; the patient, however, recovered, and was dismissed cured on August 25th, 1881. The left arytænoid cartilage was then still immobile, but some power of movement was present in the left vocal cord.

On March 21st, 1883, *i. e.* twenty months after operation, the following state of things was noted by Dr. Hopmann :— "Both vocal cords, also the left, act *quite normally;* no respitory difficulties caused on the part of the larynx and trachea, only in consequence of the *considerable and striking corpulence,* which has gradually made its appearance. At the same time the patient, whose face appears puffy, is very pale, and com-

plains of great *weakness* and *loss of strength.*" A tonic treatment by means of iron yielded no results whatsoever.

Note of June 26th, 1883.—"The general lassitude and relaxation continues; iron so far has had no effect, country air, milk cure, &c., just as little. Patient can hardly do any domestic work; washing quite impossible. Lips of a pale bluish hue, face very puffy; body shapelessly corpulent; gait waddling, legs stiff. Patient is no longer able to walk quickly. Eyelids often swollen. Menses regular but pale. Patient enjoys eating and drinking, without the feeling of extreme weakness being improved thereby. The skin of the body, which appears thickened to the finger, is waxy pale with a hue of yellow. She speaks very slowly but correctly, experiences difficulty in pronouncing words, and complains about loss of memory. Hearing good, larynx normal. Operation wound well cicatrised."

Dr. Hopmann has, after receipt of our circular, endeavoured to see the patient again, but so far without success. In his comment upon the case, he draws special attention to the *slow* development of the cachexia.

19. Prof. König (Göttingen). Dr. Müller reports from Prof. König's surgical clinique, that 10 total extirpations have been performed, 3 of which ended fatally within the first seven days after operation. In no case is anything known with regard to the existence of accessory thyroids.

"Only in one case of total extirpation, that of a boy æt. 15, the picture of myxœdema has been observed. The phenomena appeared a few weeks after operation. The goitre had been very large, and caused severe dyspnœa. The operation was performed in January, 1883. Patient is still alive, and no essential increase of the phenomena is being observed. He has been compelled to wear a tracheotomy tube the whole time."

[From Dr. Riedel's report, which follows further on under No. 26, it will be seen that cachexia strumipriva has also followed another of Prof. König's total extirpations.]

20. Prof. E. Küster (Berlin) has performed 8 total extirpations, 2 of them in carcinomatous, 6 in simple goitres.

Three patients succumbed to the consequences of the operation. Of the remaining 5, one suffering from malignant disease of the thyroid died soon afterwards from metastasis; one, a young man æt. 18, was seen a year after operation in good health, but died shortly afterwards from phthisis; one, a young girl, was seen several years later in the best of health; no details are given in the fifth case apart from its being stated, that the patient, a woman æt. 38, had to be tracheotomised half a year after the extirpation on account of bilateral paralysis of the glottis openers, which had already existed to some degree before the performance of the extirpation, and that she had been unable to dispense with the wearing of the tube.

The sixth case, in which typical cachexia strumipriva developed, has been described in full by Dr. Hans Schmid in the 'Berliner klin. Wochenschrift' of August 2nd, 1886 (No. 31), and it is therefore here only necessary to state that the patient was a boy æt. 14, that the symptoms apparently showed themselves soon after the operation, and that especially the development of the body in length appears to have become arrested, it being stated that "the body is small, undeveloped in proportion to his age."

21. Prof. Madelung (Rostock) has performed extirpation in the case of a man æt. 40, in which he removed intentionally, and as he thought completely, the goitrous gland, and which was not followed by any symptoms of cachexia strumipriva. He found, however, when the patient, who enjoyed full bodily and mental health, presented himself for examination one year after the operation, a little tumour of the size of a hazel-nut, which could only be looked upon as an accessory thyroid gland, in the neighbourhood of the cicatrix. Prof. Madelung reminds us that he has repeatedly extirpated accessory thyroid glands. [We shall have to revert to his valuable paper, "Anatomisches und Chirurgisches über die Glandula Thyreoidea Accessoria," 'Langenbeck's Archiv,' vol. xxiv, 1879, p. 71, further on.]

22. Prof. Mikulicz (Königsberg) has performed, whilst holding the Chair of Surgery at Krakau, from October, 1882,

until March, 1887, 7 total extirpations. All the patients recovered. Further sequelæ, as follows:

a. Girl, æt. 15. Operation December 16th, 1882. Quite well October, 1885.

b. Girl, æt. 20. Operation February 24th, 1883. Quite well October, 1885.

c. Girl, æt. 19. Operation July 4th, 1883. Two days after operation tetany, and closely following epilepsy, from which the patient died eight months afterwards.

d. Girl, æt. 16. Operation June, 1883. Quite well October, 1885.

e. Man, æt. 20. Operation January 7th, 1884. On the third day after operation tetany; three months after operation typical cachexia strumipriva.

f. Man, æt. 34. Operation February 28th, 1884. On the third day after operation tetany. Patient returns in December, 1886, with well-marked cachexia strumipriva.

g. Girl, æt. 19. Operation April 21st, 1885. Tetany on the second day after operation, later epilepsy. Well in October, 1885. Later fate unknown.

Prof. Mikulicz draws special attention to the fact that in all the 4 cases of the foregoing list, in which cachexia strumipriva or epilepsy, either singly or jointly, developed, tetany occurred almost immediately after the operation. He had no reason to believe that, in the 3 cases in which the patients remained well for more than two years after operation, accessory glands had been left behind. [Prof. Mikulicz's observations have been published *in extenso* in the 'Wiener med. Wochenschrift,' 1886, Nos. 1—4.]

23. Dr. Nieden (Bochum) has, in 1876, performed one total extirpation in a lady æt. 54. No systemic disturbances of any kind have followed.

24. Prof. von Nussbaum (Munich) has performed 16 total extirpations. Five patients died, 11 recovered and remained well. Prof. von Nussbaum states expressly that he never lost those who recovered entirely from view. He adds, that it is possible that in some cases small accessory glands had been behind, but that he must not have seen such in these cases,

for whenever accessory glands came into view, he removed them as well, being at that time unacquainted with the danger of cachexia strumipriva. The only explanation which he can suggest of the fact that, in his cases, the cachexia was never observed, is the possibility that sometimes accessory thyroids had escaped his notice.

25. Dr. Pauly (Posen) sends us the description of a most typical case of operative myxœdema, accompanied by a photograph showing the condition remarkably well. The patient was a boy, and at the time of the operation eighteen years old. The operation was performed by Prof. Rose, of Berlin. As Prof. Rose has not replied to our circulars, and has informed Dr. Pauly that he wishes to publish the case himself, we are, unfortunately, prevented from giving further particulars.

26. Dr. Riedel (Aix-la-Chapelle) writes: "The circular concerning the myxœdema question has induced me to hand over my material to Dr. Kribben, of this town, who has made it the subject of his inaugural thesis, which will be sent to you." [The thesis, which is entitled 'Beitrag zur operativen Behandlung des Kropfes,' von Julius Kribben, Aachen, 1887, bei J. Stercken, and in which Dr. Riedel's observations are recorded in full, has been duly received.] "All my patients have been examined again in May and June of this year; thus I am able to answer your questions* as follows:

"1. Yes. Once in 3 cases. Two unmarried women, the one thirty-two, the other fifty-six years old, who were operated upon on August 10th, 1883, and on August 27th, 1886, respectively, have remained quite well after total extirpation. But in a boy æt. 15 who was operated upon on February 2nd, 1884, very striking symptoms, not of myxœdema, but of cachexia strumipriva, have shown themselves; the hair is thin and rough, the growth of the patient's body has become stunted in comparison with that of his brothers; he speaks slowly and indistinctly, and replies slowly to every question, as if he had to recollect for some length of time. He was not very intelligent before the operation; after it he is still less so, so that his father does not consider him competent to

* See p. 94 for questions referred to.

manage a business for himself. There is, however, no œdema. (Here I will mention another case, which not I but my teacher, Prof. König, of Göttingen, operated upon in 1880 or 1881, whilst I was assistant at his clinique. A man, who was then about twenty years old, had a very large goitre removed *in toto;* recovery took place only after protracted suppuration. About one year later the patient was tracheotomised at Kaiserslautern on account of severe dyspnœa; the cicatrix was cut and the trachea was found embedded in cicatricial tissue; whether it was narrowed I do not know. This patient came to see me in 1882 in Aix, when I was surprised to behold the man with an enormously puffy face, which, however, was not œdematous *sensu strictiore.* He spoke clumsily, almost inarticulately, and complained of general weakness and palpitation of the heart, but suffered no longer from dyspnœa. He was a tramp; I have since heard nothing of him).

"2. I have performed 4 total extirpations, one of which ended fatally in consequence of paralysis of the recurrent or rather pneumogastric nerves. (See 'Centralblatt für med. Wissenschaften,' 1882.). . . . .

[The next statements refer to Dr. Riedel's experiences of partial extirpations and are reported under Section B.]

"3. My statements concerning completeness or incompleteness of the operation are to be looked upon as certain; accessory thyroid glands have not been present in my few cases of total extirpation; at least no tumour could afterwards be detected."

On the day following the writing of this letter Dr. Riedel corrected his own statements as follows:

". . . . On the other hand one case of total extirpation has taken a different course from what I stated. This is the case of the unmarried lady, æt. 56, operated upon on August 27th, 1886. I myself had not seen the patient again; her adviser of *this* place, who had brought her to me, told me in May that she was going on well; about Christmas she removed from here to the other side of the Rhine. In order to be quite certain, I wrote to her a fortnight ago, and requested her to inform me or Dr. Kribben whether she was still going on well.

I received no reply and, therefore concluded that she was going on all right, but just now I received a letter from Dr. Kribben, in which he informs me that he had had a communication from the practitioner who is *at present* in charge of the patient, to the effect that complete myxœdema had made its appearance. I had removed the goitre *in toto*, because it had undergone general gelatinous degeneration; the patient had most severe dyspnœa and extensive bronchitis, so that I did not wish to make experiments with her, such as leaving some parts of the goitre behind. And now myxœdema!"

[From the letter of the last-mentioned practitioner, Dr. Kemmerich, of Glehn, which is communicated in full in Dr. Kribben's thesis, there can, indeed, be no doubt that typical myxœdema has occurred in this case. "The operation wound," it is stated, "is quite healed, nothing to be felt of the goitrous gland. The enormous dyspnœa, which existed before the operation, has entirely disappeared. But the patient has since the operation broken down physically and mentally. For a long time she has had to remain in bed entirely, now she moves with difficulty through the room and the gardens; she is unable to do the lightest work, and is very easily fatigued. The hair has fallen off in parts, the features have become considerably changed; the face looks puffy, and had assumed some time ago an extraordinarily stupid expression, which has a little improved during the last week. The patient generally sits still, silent and cross, without speaking a word, and some external influence, such as a little excitement, a visit, &c., is always necessary to wake her up from her dull brooding. Under such circumstances she gives clear replies, which, however, often seem to cause her difficulties. The hands are also somewhat swollen, without demonstrable œdema. Urine free from albumen and sugar. The feet are not swollen."

Dr. Riedel's replies have been here reproduced *verbatim*, because the communication of Prof. König's, and of this last case of his own, illustrate better than any general descriptions could the difficulties with which the endeavours of getting reliable information concerning the state of the patients after operation are beset.]

VI. *Great Britain and Ireland.*

27. Dr. T. P. Bramwell (Perth). One total extirpation. Patient was a farmer æt. 25. Date of operation about May, 1885. Dr. Bramwell does not think there were any supplementary glands. The patient was watched all the time until the date of the communication, and there were never any signs of myxœdema. [The case is described in the 'British Medical Journal,' May 29th, 1886.]

28. Mr. T. F. Chavasse (Birmingham) reports one case and mentions another, both of which were under the care of Mr. Jolly in the Birmingham General Hospital, and in both of which the whole thyroid gland was extirpated. In the first the patient was a man æt. 31. The operation was performed on May 11th, 1883. "The patient was seen a few months ago in usual health, and no sign (facially at all events) of myxœdema." In the second case the patient was a woman over thirty years of age, and the operation was performed two or three years ago. The patient is still living. Mr. Chavassse understands, however, that "some form of tumour growth has appeared in the temporal region." As far as he can learn, there are no symptoms of cachexia.

29. Dr. James Gordon (East Linton, N.B.) reports a most typical case of cachexia strumipriva occurring in a female æt. 20, very shortly after the removal of the whole thyroid gland, which was removed eleven years ago by Sir Joseph Lister. When she left the hospital three months after operation her face and voice were so much changed that her own mother did not recognise her. For further details we must refer to the careful description given by Dr. Gordon in the 'Lancet' of July 10th, 1886. Several of the symptoms have lately shown slight signs of improvement. Dr. Gordon in his letter draws special attention to the marked diminution of urine which occurred in this case.

30. Sir Joseph Lister (London) has made, apart from the case mentioned sub 59, several other total extirpations, of which, however, unfortunately no very precise notes could be obtained.

In one case in which he removed the whole gland from a woman æt. 27, on January 28th, 1880 (see Clinical Society's 'Transactions,' vol. xiv, 1881, p. 44), inquiries were made in 1883 after the publication of Kocher's experiences, and in reply it was stated that the patient enjoyed good health, but the reply came not from medical quarters, and nothing was said about the existence or otherwise of an accessory gland. [Another case of Sir Joseph's Lister's will be reported under "Partial Extirpations," as it is expressly stated that, although the operation was apparently intended to be complete, *probably* not all parts of the tumour were removed.]

31. Mr. Bennett May (Birmingham). One "complete extirpation with simultaneous tracheotomy for supposed malignant disease. Fatal in four days." [See 'Birmingham Med. Review,' November, 1884.]

32. Mr. Henry Morris (London). One total extirpation. Patient was a girl æt. 14. Date of operation July 12th, 1884. Recovery. Patient, according to latest reports (June, 1887), quite well. [See 'Lancet,' September 24th, 1887.] Since the operation patient has developed what is obviously hypertrophy of a suprahyoid accessory thyroid on left side. From personal inspection of specimen, it is established beyond doubt that the removal was complete.

33. Mr. T. H. Morse (Norwich) writes: "One case has come under my care in which, I believe, the gland was entirely removed. (I am aware that this is not what I stated in the 'Lancet,' 1885, p. 1163.)" [In his publication the author had stated that probably the right lobe had been left behind.] The patient was a woman æt. 22. Date of operation April 4th, 1884. Mr. Morse has seen the patient in March, 1887. No symptoms of cachexia strumipriva have manifested themselves.

34. Mr. W. D. Spanton (Hanley). "One case of total extirpation in a middle-aged woman about three years ago. She is now quite well and has been ever since." [See 'Brit. Med. Journal,' January 5th, 1884.]

35. Sir William Stokes (Dublin) has performed one total extirpation in a girl æt. 18, in which *acute* myxœdema

followed eleven days after the extirpation, which had been performed in two acts, separated by an interval of three and a half months, had become complete. After the first act, in which the left lobe was removed, only diminution in size of the right lobe, but no myxœdematous symptoms, followed; such—especially mental torpidity, puffiness of eyelids, face, hands and feet, slowness of speech—occurred, however, ushered in by convulsive seizures, eleven days after the second operation, by which the rest of the gland was removed. The patient died from exhaustion twenty-one days after the second operation. The post-mortem examination threw no light upon the phenomena observed during life. A small tumour had been left "in front of the trachea" which, when microscopically examined, was found to be "composed of glandular tissue, resembling that of the normal thyroid body." [Further details will be found in 'British Medical Journal,' October 16th, 1886.]

36. Dr. Patrick Heron Watson (Edinburgh) believes that the number of his total extirpations amounts to 11. He has, however, not been able to follow them up. So far as he saw any of these cases after operation there was no myxœdema.

37. Mr. John Wood (London) has performed one total extirpation in a woman, who recovered, and has heard from a medical man several months after operation, that the patient was "quite well and that *no* œdema had followed the operation up to that time." Since then he has lost sight of the case.

VII. *Italy.*

38. Prof. E. Dionisio (Turin) has performed 2 total extirpations, one in 1879, the other in 1885. Both patients were women, the first twenty-five, the second thirty years old. In the second case recurrence took place, and a second operation was performed. Prof. Dionisio has kept both patients under his eyes up to the present; he is convinced that in both cases the removal of the gland is complete, and states that there has not been in either case any sign of cachexia strumipriva.

[See his pamphlets, 'Estirpazione di gozzo,' 1879; "Doppio Gozzo," in 'Gazzetta delle Cliniche,' 1885, 2 semestre, No. 10, and 'Riproduzione di Neoplasma Tiroideo,' ibidem, 1886, 1 semestre, No. 22.]

VIII. *Russia.*

39. Dr. A. Knie (Moscow) has performed 3 total extirpations, all in women. The patients have been kept under observation; no affection has been observed pointing to disease of the central nervous system. Dr. Knie, however, has given up performing total extirpation since the publication of Kocher's results.

40. Dr. N. M. Wolkowitch (Kiew) reports 2 cases of total extirpation, performed by Prof. Bornhaupt, of Kiew, the first of which is very remarkable. The patient was a married, thin and anæmic woman, æt. 38, who came from a goitrous district, and whose mother had also suffered from goitre. In her own case the goitre had been in existence ten years, was very large, occupied the whole of the gland, and caused asthmatic attacks and dysphagia, sometimes serious dyspnœa. Total extirpation was performed on January 21st, 1884. There was comparatively little hæmorrhage during the operation. Soon after it had been finished, however, a rather abundant after-hæmorrhage took place, so that, on the whole, the loss of blood was to be looked upon as considerable in so anæmic a person. ". . . . In spite of a comparatively favorable course of healing of the operation wound the general health improved in no way. On the contrary, the patient became more and more anæmic and thin; besides soon after the operation quite a series of curious disturbances appeared. Thus, on the fifth day after operation attacks of tetany occurred, which were at first limited to contractures of the fingers and convulsive motions of the muscles of the right leg; they increased later on in intensity and assumed the form of tonic spasms of the flexors of the fingers and single groups of muscles of the legs. Sometimes these spasms extended over the greater part of the

muscles of the body (face, neck, chest, abdomen, &c.). By means of pressure upon the brachial artery spasms of the fingers could be *ad libitum* produced, by pressure upon the femoral artery (sub lig. Poupartii), convulsions of the legs (Trousseau's sign). Besides troubles of sensation occurred, which manifested themselves by a feeling of coldness in hands and feet and numbness of the hands. Both sets of phenomena, the tonic spasms as well as the trouble of sensation, lasted with varying intensity until the death of the patient, which occurred in the beginning of May, *i. e.* three and a half months after operation.

"Towards the end of April I had the opportunity of re-examining the patient in the Alexander Town Hospital, after I had not seen her for more than a month's time, she having left the surgical clinique. I found the following state of things. Above all eczema, distinguished by considerable and perfectly symmetrical distribution. It extended over the whole surfaces of both legs, over the lower halves of abdomen and back, over the lower halves of both breasts, over both elbows, over the dorsal aspects of the fingers in the territory of the articulatio interphalangea secunda, and finally over the neighbourhood of the fistulous opening in the neck. [The wound had not entirely healed.] The eczematous parts of the skin not only showed perfect symmetry with regard to form and size, but were also divided from the healthy skin by a sharp border. This was especially evident in the abdomen, where this border, when the patient stood erect, represented a horizontal, almost straight line. This eczema had made its appearance in the neighbourhood of the wound already at the time when the patient was still in the surgical clinique; its obstinacy had been remarkable and the patient had not got rid of it when she left the clinique. Inasmuch as the eczema of the body, which was characterised by its sharply limited, symmetrical, and patchy distribution, was in no connection with the eczema existing in the neighbourhood of the wound, it is not improbable that it was due to a severe trophic disturbance of the nervous system. This presumption seems all the more likely because there were still other phenomena present which pointed to such a nervous

affection. Thus, *e. g.*, the skin everywhere appeared so to say swollen, so that it made the impression as if the patient had been amplified. Different from common œdema, the swelling did not pit on pressure. In the parts which were free from eczema, the skin was dry and pale, on the dorsal aspects of the articular surfaces of the fingers, brittle and callous. This skin affection evidently reminded one of myxœdema sive myxoderma. There was a certain stupidity and apathy in the expression of the patient's face. Moreover loss of memory and weakness of hearing power were found to be present, there was epiphora, the voice was hoarse and heavy. Moist râles were heard over both bases. There was a little albumen in the urine, and occasionally a little rise of temperature in the evening. The patient constantly complained of feeling cold, and wrapped herself up in warm shawls. Associated with these symptoms were the tonic spasms of the flexors of the fingers, and the numbness which have been mentioned before.

"I am unable to make positive statements concerning the condition of the mucous membranes, having omitted to examine them when I saw the patient again. The wound was not yet closed and appeared as a pus-secreting fistula over the manubrium sterni, running in an upward direction and ending in a cul-de-sac on the left side of the trachea.

"All the phenomena just mentioned: tonic spasms, troubles of sensation, affections of the skin (eczema and myxoderma), dulness of hearing, clumsiness of speech, together with the affections of the psychical sphere (apathy, weakness of memory, stupidity), present the typical picture of a deep disturbance of the nervous system. The cause of this disturbance, which ended fatally, must, in my opinion, be sought for in the removal of the goitre, that is to say, of the thyroid gland. Under no circumstances can it be regarded as a mere consequence of the operation, however severe it may have been for so weak a person. I much regret that I was not informed at the time of the patient's death, and I therefore was not present at the autopsy, which, in obedience to the wishes of the relatives, was only partial, the neck and the abdominal cavity alone being examined. The results of this examination, of which I was

apprised afterwards, revealed absolutely no facts by the help of which one could explain so interesting a disturbance of the organism."

In Dr. Wolkowitch's second case the patient was a woman æt. 18. The operation was performed by Prof. Bornhaupt on September 16th, 1885. There was considerable loss of blood during the operation. Within the first month and a half, several symptoms occurred (great frequency of pulse, drawing pains in legs, arms and back, apathy and ill-humour), which Dr. Wolkowitch is inclined to look upon in part as mild symptoms of tetany, and to explain as partly due to anæmia, partly to disturbances in the genital sphere, which were found out during her stay in the clinique. She recovered from all these symptoms after a month and a half, and informed Dr. Wolkowitch by letter a year and a half later that she felt much better than in the first time after the operation, and that she was *enceinte*. [Further details, concerning Dr. Wolkowitch's first case, will be found in 'Chirurg. Westnie,' January, 1885.]

41. Dr. A. Zander (Perm). One total extirpation. Death from tetanus.

IX. *Sweden and Norway.*

42. Prof. John Berg (Stockholm). "In 6 cases the excision was total, or at least believed to be so; in one of these cases the patient has got a new goitre." All these operations were performed before the beginning of the year 1884. In two cases death ensued, once from pneumonia and once from sepsis. [The wording of Prof. Berg's letter leaves it doubtful whether these deaths occurred in his cases of total or partial thyroidectomy.] "Myxœdema has been observed in none of my cases."

X. *Switzerland.*

43. Dr. G. Feurer (St. Gallen) has, after deduction of some fatal cases, in which it is left doubtful whether the extirpation was total or partial, performed 2 total extirpations. In the first case the patient was a man æt. 64, who suffered from

carcinoma of the thyroid. The patient recovered, showed no signs of myxœdema, and died in April, 1886, from metastatic carcinoma in the trachea. The second patient was a girl æt. 19. In October, 1884, the right, and in May, 1885, the left lobe and isthmus were removed on account of colloid, goitrous degeneration. The patient has remained well up to the present, and is in good health. Dr. Feurer firmly believes that neither accessory thyroids nor rest of the main gland have remained behind.

44. Dr. Fritzsche (Glarus) has performed one total extirpation in which "the symptoms of cachexia strumipriva followed almost immediately the removal of the thyroid gland." The patient was a woman æt. 31. The operation was performed on September 14th, 1882. "Already a few weeks afterwards thickening of the lips, later of the eyelids, &c., very characteristic mental indifference, &c. Death on July 13th, 1885, from phthisis pulmonum. At the post-mortem examination no trace of goitre is found. This case of (*scilicet:* "operative," F.S.) myxœdema has not yet been published." [Dr. Fritzsche himself states that he has performed *two* total extirpations, but as he adds that in one of these cases—that of a girl æt. 12,—"two pieces of goitrous tissue, each of the size of a hazel nut, were intentionally left behind," this case had, in accordance with the principles followed throughout in the arrangement of this report, to be classified amongst the *partial* extirpations. The patient in question is at present, several years after operation, quite well.]

45. Dr. Kappeler (Münsterlingen) has performed 8 total extirpations, 3 of which ended fatally, one from sepsis, the second from embolic pneumonia, the third from collapse. In 2 other cases death ensued from nephritis, in one of these nine months after operation, in the other the date of death is not given. In the sixth case the operation was performed on account of malignant disease of the thyroid, and the patient died ten months later from recurrence. One of the cured patients was lost from view.

The remaining case is here given in Dr. Kappeler's own words:

"Heinrich M—, æt. 12½. Parenchymatous goitre. Operation on June 11th, 1880. Immediately after operation sonorous inspirations and inspiratory recession of the chest walls. Laryngoscopically abductor paralysis is seen. These symptoms were gradually disappearing whilst the boy was still in the hospital.

"July 16th, 1882.—Slight cyanosis of the face; is dyspnœtic on exertion, voice weak but clear; paresis of right posterior crico-arytænoid muscle.

"April 12th, 1884.—Patient has not grown since the operation. Intelligence moderate, but patient can well follow the instruction given in his school. Still slight dyspnœa on exertion.

"October 14th, 1885.—Patient enters the hospital again as in-patient. He states that he has done his work in school equally well after the operation as before, but that he had had to exert himself much more in order to do so. Frequent giddiness, no headache, complains of persistent fatigue. Eyesight good. No coming off of hairs observed. Suffers frequently from dyspnœa and dyspepsia. Length of body = 141·5 cm. Acuteness of vision and result of ophthalmoscopic examination normal. Muscles relaxed, but nowhere atrophy, no pains in joints and muscles. Patient complains of a feeling of cold in hands and feet. They are almost always cyanotic. No swelling of the skin of the face. Speech not conspicuously slow. Patient himself has not observed diminution of his mental powers. He replies quickly and precisely. Body well proportioned, skin not dry. Face pale; mucous membranes not remarkably pale. Radial pulse small. Over the apex weak systolic blowing sound. Slight paresis of the right vocal cord. Paralysis of both (?) posterior crico-arytænoid muscles, so that on deep inspiration the vocal cords somewhat approach each other. Superior tracheotomy on November 20th, 1885. Status when leaving the hospital on December 18th, 1885:—Length of body the same. Increase in weight of 10½ lbs. Still cyanosis. Otherwise is much more lively and gay, feels well, complains no more of giddiness. Circumference of chest 71 cm.

"May 3rd, 1886.—Length of body 146½ cm., circumference of chest 75 cm. Appearance better. Lips still somewhat bulky and slightly cyanotic. Weight 89 lbs. Makes a good income as draughtsman. Condition of larynx the same as before.

"August 14th, 1886.—Length of body and circumference of chest the same as before, weight 20 lbs. Complains again of frequent occipital pains, dulness of apprehension, early fatigue when thinking, replies to questions only slowly and heavily. Acuteness of vision normal. Skin very dry. Hearing power normal. No albumen nor sugar in urine. Has three healthy sisters. The eldest, æt. 16, is said to be tall and strong.

"June 4th, 1887.—According to communication by letter patient feels quite well."

46. Prof. Kocher (Berne) writes:

"I have received reports of 32 of those of my patients in whom total extirpation of the thyroid gland on account of goitre had been performed, that is to say, I have had the opportunity of personally examining 29 of them, whilst I have received reliable information from 3. Of these 32 patients so far 6 have died, all of whom had shown signs of cachexia strumipriva in its most pronounced form. Only one of those had not been seen again by me since the operation. In 3 cases have I been able to make myself a post-mortem examination.

"Of the remaining 26, in 20 the phenomena of cachexia strumipriva are present. In most of them a slow progression of the symptoms can be made out, in a few the intensity of the phenomena is varying according to season, occupation, and external unfavorable influences of other kind. In one single patient the symptoms have so far undergone a regressive metamorphosis that his outward appearance no longer betrays his disease, and that complete working power has returned.

"In 6 patients not any, or at any rate only the slightest, symptoms have occurred, but in all these patients without exception return of the goitres has taken place, starting either from left-behind remnants of glandular tissue, or from accessory thyroid glands. Except one case, I have been able

to personally examine again all the cases of recurrence. Some of these patients had not been aware themselves of the recurrence, and therefore been unable to mention anything about it in the earlier reports they had sent me." [Prof. Kocher then states his experiences concerning partial extirpation, which will be found under B 44.]

47. Dr. A. Kottmann (Solothurn) has performed 8 total extirpations, with one death from œdema of the lung. Three patients were males, aged forty, twenty-one, and twenty-one respectively; 5 were females, aged twelve, seventeen, fourteen, thirty-six, and forty-one. In the girl æt. 12 the operation was performed twice, because one year after apparently total extirpation, recurrence of the goitre took place, and dyspnœa was again produced. Neither in this nor in 5 of the other cases which recovered symptoms of cachexia strumipriva occurred, and such were observed in one only of Dr. Kottmann's cases. The patient was "a half idiot, and melancholicus," A. G—, æt. 21, who already before the operation had attempted to commit suicide. He suffered from a hard parenchymatous enlargement of the whole gland, causing dyspnœa and cyanosis. On June 14th, 1883, the left half of the thyroid and the isthmus were removed; on June 23rd, 1884, the other half, considerable dyspnœa having occurred again. "Afterwards signs of cachexia strumipriva, consisting in myxœdema, which, however, improved again in the course of time. The mental condition remained the same before and after operation."

Dr. Kottmann summarises his opinion as follows: "According to my experiences, cachexia strumipriva after total thyroidectomy only occurs where goitre is endemic. In our neighbourhood goitre is not endemic, and occurs only quite sporadically, nor is endemic cretinism met with here. The only case, in which after total thyroidectomy the symptoms of the cachexia developed—the case of A. G— above referred to—had come here from Brienz in the Berner Oberland and returned to his native place later on again."

48. Dr. Kuhn (St. Gallen) has in none of his 7 total extirpations seen any signs of myxœdema follow the operation.

His youngest patient was twenty years old, most of his patients were in more advanced years.

49. Prof. J. L. Reverdin (Geneva), who has altogether performed 18 total extirpations, with 3 deaths after operation, has seen operative myxœdema in 5 out of 11 cases of total extirpation of the thyroid gland, which could be followed up after operation. These cases were first described in a communication, "Note sur vingt-deux opérations de goitre," which Prof. J. L. Reverdin and Dr. Auguste Reverdin published in the 'Revue médicale de la Suisse romande,' April —June, 1883. The youngest of the patients was twenty years old.

Since then Prof. Reverdin has given a further account of the progress of the disease in these five patients in a paper read before the Congrès français de chirurgie on October 18th, 1886, and published in the 'Revue médicale de la Suisse romande of 1887,' a copy of which he has kindly forwarded to us. In this paper, in which he also discusses the question of priority pending between himself and Prof. Kocher, and in which he strongly defends the name of "myxœdème opératoire" against that of "cachexia strumipriva," he subdivides his five cases into two groups. The first of these is characterised by total absence of any traces of thyroid tissue, in the next, the second, in which the symptoms from the very beginning had been somewhat abortive or attenuated (Prof. Reverdin gives to this form the name of "myxœdème fruste"), by gradual improvement and by the *late* apparition of a small tumour in the neck, presenting all the appearances of a small accessory or rather aberrant thyroid gland. Of the 5 cases, 3 belong to the first, 2 to the second group. One of the patients belonging to the first group, a young man, who had been operated upon on October 6th, 1880, died from pulmonary tuberculosis on January 22nd, 1886. From the autopsy no important conclusions can be drawn, as stated by Prof. Reverdin himself, in view of the tubercular complication, which probably had altered the purity of the lesions proper to myxœdema. It may, however, be mentioned that the limbs, the mucous mem-

brane of the larynx, and the face, were found to be slightly œdematous. "The dura mater was firmly adherent along the sagittal suture. The pia mater presented on the convexity of both hemispheres a gelatinous, slightly opaque, whitish infiltration; the corpuscles of Pacchioni were much developed in parts. General hyperæmia of the brain, otherwise nothing abnormal." In the second case, belonging to the first group, that of a young lady who at the age of twenty had been operated upon on March 4th, 1881, and who was last heard of in October, 1886, the disease had taken a slow progressive course, interrupted by marked remissions, which were characterised by attenuation of the symptoms without, however, their ever disappearing, even for a time, completely. In the third case, that of a man æt. 40, who was operated upon on December 27th, 1880, and who was last heard of in October, 1886, the symptoms, which were at first rather grave, have shown a gradual but persistent improvement, which has continued all the five years since it commenced. Supra-clavicular pseudo-lipomata have developed in this case, but there is no trace of thyroid tissue to be detected about the neck.

In the 2 cases belonging to the second group the symptoms, which had been incomplete from the first, although there could not be any doubt that operative myxœdema had occurred, gradually and greatly improved without, however, entirely disappearing, whilst in the first of these cases, that of a lady æt. 27, who had been operated upon on November 9th, 1880, and in the second case, that of a lady æt. 33, operated upon on November 15th, 1880, in December, 1885, *i. e.* in both cases *five years after operation*, the small thyroid tumours above referred to were detected in the neighbourhood of the larynx. As there had been intermediate examinations of the patients, there can be but little doubt that these tumours had only recently made their appearance, and Prof. Reverdin discusses the question whether a real *regeneration* of thyroid tissue had taken place, or whether merely a *late* development of parts of the gland, unintentionally left behind, or of pre-existing, aberring, thyroid glands had taken place. He con-

siders the latter alternative as much more probable, and draws from these experiences the conclusion that operative myxœdema, though in an attenuated form, may follow, even if the extirpation has not been, in reality, a total one, and that the axiom: "Total extirpation of the thyroid gland *only* is followed by myxœdema," is no longer tenable. In further support of this, he brings forward 2 cases of attenuated myxœdema, which followed in his own experience *partial* extirpation of the thyroid gland. These will be found referred to under B 46. Since his first publication Prof. Reverdin has only, he informs us, performed one more total extirpation, which ended fatally.

50. Dr. Roux (Lausanne) has performed 2 total extirpations. He is certain that the operation was complete in both instances. In the first case the patient was a man æt. 39; the goitre was carcinomatous; recovery took place, but the patient was lost from view. In the second case, that of a woman æt. 50, cachexia strumipriva occurred. There is some swelling of the face, which appears coarse, the skin is waxy and pale, the eyelids and lips as well as the alæ nasi are thickened. The œdema, which is much less developed on the body than in the face, does not pit on pressure. The skin is everywhere translucent and rough to the touch. No perspiration. Sensation of chilliness. The hands have lost all shapeliness. The speech is slow. The first symptom in the case was a sensation of fatigue when "thinking." This fatigue and slowness of thought and volition are very conspicuous and form almost the only symptoms which really disturb the very intelligent patient. Otherwise she is quite happy, is busy all the day long, eats and drinks well, and does not trouble about the slowness of speech and the slight disfigurement. All these symptoms appeared within the first year after the operation and have continued since, without aggravation, for nearly two years. Dr. Roux mentions additionally that in the neck above and below the incision a more considerable swelling exists with formation of comedones, which produce a hard, sometimes stony, white or black secretion. In some spots real calcareous needles project, so that the

hand of the investigator, when passing over the part, is scratched.

51. Prof. Socin (Bâle) writes:

"Although I frequently have the opportunity of performing operations for goitre, I have always—indeed long before the cachexia became known—avoided performing total extirpation of the thyroid gland. My reasons were exclusively of a *cosmetic* nature, inasmuch as the neck after such operations assumes a very ugly form. In the course of time I convinced myself more and more, that in the *great majority* of all cases an *intraglandular* extirpation of the goitrous tumour or *tumours* can be performed, and that hereby the consequences of the operation are improved in every respect. This operative method of mine has been described at length in my annual reports as well as in the papers of my pupils, Dr. Garrè and Dr. Keser. Thus it is explained that I have performed total extirpation in 5 cases only, and I can assume that in all the organ has really been removed in its totality and that accessory thyroid glands were not demonstrable. The patients were all females.

"*a.* Woman, æt. 56. Valvular disease of heart. Goitre larger than man's head. Operation November 30th, 1880. Severe hæmorrhage. Death from acute anæmia one hour after end of operation in spite of transfusion of defibrinated blood.

"*b.* Woman, æt. 40. Very large goitre. Operation November 20th, 1884. Rapid recovery.

"*c.* Girl, æt. 26. Small goitre causing great stenosis of the trachea. *Three times operated,* 1874, 1880, 1882. At the last operation (July 30th, 1882) the rest of the thyroid gland was removed. Quick recovery.

"*d.* Woman, æt. 62. Large goitre, removed May 12th, 1884. Quick recovery.

"*e.* Girl, æt. 31. Goitre of size of child's head. Operation on November 12th, 1884. Was already before the operation much reduced in mental capacity. Quick recovery.

"Of the 4 surviving patients I could only find 2; of the 2 others I only heard that they were 'healthy.'

"Patient *d* shows no sign whatever of systemic disease. Neither her bodily nor her mental condition has been influenced by the operation.

"The patient *c* I have seen again, on April 1st, 1885. She suffered from *anæmia* and *general weakness*. Since the last operation she complains of tinnitus and absent-mindedness. She had, however, already before the *first* operation been very anæmic and but little developed mentally. But one year later, in May, 1886, it was ascertained that her hair had come off (this had *not* been the case formerly), that *sometimes her hands and feet are swollen*, that the *speech is slow*, the *movements not well co-ordinated*, the *memory very weak*. This is certainly an abortive type of myxœdema in which the *very late* and incomplete form of the disease is remarkable."

52. Dr. Vouviller (St. Gallen) has had the kindness to send us an excellent photograph of one of the patients operated upon by Prof. Kocher, who has since come under his care, and of accompanying this by a short description of her present state. The photograph shows the typical appearances of myxœdema. From the description the following may be quoted:

"A. H—, born 1870, at Köniz, near Berne. Total extirpation of goitre performed eleven years ago by Prof. Kocher. Growth of body since stunted, but patient could well follow instruction at school, which she left in 1886. At present (January, 1887) patient is curiously small (133 cm. high), undeveloped, not yet menstruated. Face puffy, skin dry and easily exfoliating, hair very thin. The whole bearing of the patient is very infantile; her intelligence, however, has not suffered to a marked degree."

53. Dr. Wiesmann (Herisau) has performed 6 total extirpations, in none of which symptoms of cachexia strumipriva followed. One of the patients was a man, æt. 45, the other 5 were females whose ages varied from seventeen to forty-one. In one of the cases, that of a married woman æt. 41, after the operation occasionally attacks of faintness, numbness of the limbs and derangements of consciousness occurred. There had, however, already before the operation been nervous dis-

turbances and, Dr. Wiesmann states expressly, "no myxœdema."

In addition to the above material, which we owe to the kindness of the surgeons themselves who have performed total expiration of the goitrous thyroid gland, we have found some evidence bearing upon the question in published records. It is much to be regretted that the authors of these publications have not replied to our repeated requests for direct information, because in most instances their original publications are not accessible to us, and we have thus been compelled to fall back upon the short notices concerning their experiences which we found either in the writings of others or in analytical journals. Still, it seemed but right to leave their results not out of consideration. On the other hand, no attempt has been made to collect the very numerous publications concerning extirpation of the thyroid gland in which the question of the later sequelæ of the operation is either passed over in complete silence or in which, as in Baillarger's case of cretinoid idiotism ('Annales médico-psychologiques,' March, 1884, p. 124, quoted from Bourneville and Bricon, loc. cit.), the extirpation of the gland was merely "probable," or in which the publication took place immediately after operation, or in which, as in Rotter's* paper, the causal connection between the operation and the myxœdematous sequelæ is simply doubted, without any evidence being adduced which could justify such a conclusion, &c.

Acting upon these principles we have found the following additional evidence:

54. Prof. Bottini (Pavia) states ("L'estirpazione del gozzo e le sue cliniche consequenze," 'La Medicina contemporanea,' Nos. 10—11, 1884, abstract in 'Internationales Centralblatt für Laryngologie, &c.,' 1885—1886, p. 33) that after 52 total extirpations, 8 of which ended fatally, he has not seen a single time symptoms of cachexia strumipriva supervene. He has seen his surviving patients again and again, and has, according to the abstract, always found them enjoying excellent

* "Die operative Behandlung des Kropfes," 'Archiv für klinische Chirurgie, vol. xxxi, 1884, p. 683.

health, and without any diminution of their mental faculties. He is inclined to believe that Kocher's and Reverdin's results must be attributed to the endemic character of goitre in the localities in which they practise, and thinks that the cretinoid affection in these cases took its course *in spite* of the extirpation of the goitre, which merely represented an accompanying symptom of the disease.

55. Dr. Julliard (Geneva) has seen ("Trente et une extirpations de goitre," 'Revue de chirurgie,' 1883, p. 585) in 10 total extirpations 2 cases of cachexia strumipriva. In one case the patient was a woman æt. 66. The symptoms occurred five or six months after operation and consisted in great anæmia, pallor of the skin, very great weakness, and œdema of the legs. Several months later improvement took place. In the second case the patient was a youth æt. 17. The operation was performed in 1880. In January, 1881, weakness, fatigue. The patient, who was formerly gay and lively, got taciturn and suspicious; he loves solitude; he does not grow any more; he feels cold; he has no longer the strength to work; face infiltrated, no albuminuria nor marked œdema, but thickening of the skin of the face and of the hands. [Quoted from Bourneville and Bricon, loc. cit.]

56. Sir William Mac Cormac (London), 1 total extirpation ('British Med. Journal,' 1884, vol. ii, p. 229). Female, married, æt. 29. Large goitre removed on December 3rd, 1883. In June, 1884, no signs of myxœdema or cachexia strumipriva. There was, however, "above the right clavicle a separate freely movable tumour, independent of the large one, about the size of a large walnut, whose nature could not be determined." Further on Sir William says: "It is possible that in my case the small tumour left behind is thyroid in nature, and this, according to Kocher's views, would explain the absence in this instance of any of the alleged characteristic symptoms."

57. Dr. N. Omboni ("Tre gozzi retrosternali guariti colla totale estirpazione," 'Bollet. del Comitato med. Cremonese,' ii, 1885, quoted from 'International. Centralblatt für Laryngologie, &c.,' 1886—1887, p. 29) has performed 3 total extirpa-

tions in 3 males, æt. 21, 12, and 7 respectively, without any symptoms of cachexia strumipriva developing.

58. Dr. Ruggi (Bologna) ('La Semaine Médicale,' April 28th, 1886, quoted from Reverdin's "Contribution à l'étude du myxœdème") has seen two cases of operative myxœdema in 5 total extirpations. No further details are given by Reverdin.

B. Results of Partial Extirpation or Resection of the Goitrous Thyroid Gland.

I. *Austria.*

1. Prof. Billroth (Vienna). See remarks under "Results of Total Extirpation," and Prof. Wölfler's report under B. 5.

2. Prof. Gussenbauer (Prague) has performed 23 partial thyroidectomies on 8 male and 15 female patients. No report has been received from 11 patients; the other 12 are permanently cured and well.

3. Prof. Hofmokl (Vienna). One partial removal in a woman. Patient recovered, but has not been heard of since the operation.

4. Prof. von Mosetig-Moorhof (Vienna.) Five partial extirpations, 3 for parenchymatous, 2 for cystic goitre. All patients recovered, and remained well. No signs of myxœdema.

5. Prof. Wölfler (Graz) merely states that in Billroth's clinique from 1877—1884 56 partial extirpations were performed. No particulars are given.

II. *Denmark.*

6. Dr. Fage Hansen (Aarhuus) has performed one partial thyroidectomy in a woman æt. 66, for a very large goitre which had been in existence twenty-five years. Only a small piece of the left lobe was left behind. Date of operation March 11th, 1885. No cachexia. Patient last seen on June 2nd, 1887.

7. Prof. Studsgaard (Copenhagen) has performed 17 partial extirpations. He has never seen cachexia strumipriva follow these operations.

III. *France.*

8. Prof. Monod (Paris). Three partial removals. No symptoms of myxœdema followed, but in one case only did Prof. Monod see his patient again after a lapse of more than six months after operation.

9. Prof. Poncet (Lyon) gives particulars of 7 cases of partial extirpation, in all of which the patients recovered, and 6 of which were not followed by any symptoms of a myxœdematous nature, but the remaining case is of such exceptional interest that a brief description of its features will be given in Prof. Poncet's own words, although it has already been published in Dr. Boyer's thesis, referred to under "Total Extirpations," No. 10.

"Median goitre. Partial ablation of the gland. C. G—, æt. 19, operated upon on May 23rd, 1882. The middle lobe only was extirpated. Partial myxœdema.

"The patient, who was seen again about two years after the operation (February 18th, 1884) states that six months after the operation he experienced for one month a slight sensation of general weakness and weariness. He has never observed any puffiness of his face or limbs. His voice, which had been a little rough and discordant before the operation, became normal, and the attacks of dyspnœa disappeared altogether. The patient was seen and examined again by M. Poncet on January 24th, 1887. He states that since the operation he has been unable to regain his former strength, and that he has observed, especially in the course of the last year, a notable failing of his powers; he complains of depression of spirits, of heaviness of his head, and especially of an almost persistent sense of fatigue. He has been compelled to give up the heavy work of a blacksmith, which he had done before this partial thyroidectomy. He speaks with a certain slowness, appears listless, and complains sometimes of sensa-

tions of cold, which are not justified by the external conditions. The general nutrition is languishing, the skin of the face anæmic but not œdematous.

"Such are the signs presented by C. G— five years after a partial thyroidectomy, and though one can make out distinctly the lateral lobes of the gland I have no hesitation in connecting them with a partial myxœdema. We have to do, in fact, with a tall, well-built man of twenty-four, who ought to present all the attributes of strength, and in whom no visceral lesions which could possibly explain this loss of strength are found."

Prof. Poncet concludes his general report by saying: "From these observations of partial or total thyroidectomy it follows that I have with certainty observed any of the symptoms of myxœdema in one only of the patients I have operated upon, and in his case a *partial* extirpation of the thyroid gland had been performed. This fact appears to me to possess a great importance."

IV. *Germany.*

10. Prof. Bardeleben (Berlin) has performed from 1876—1885 9 partial extirpations. All the patients recovered. No symptoms of cachexia strumipriva occurred in any of these cases.

11. Dr. Baumgärtner (Baden-Baden). Some 20 partial extirpations, none of them followed by signs of cachexia strumipriva.

12. Prof. E. Boeckel (Strassburg) has in about 10 cases of unilateral extirpation never seen any symptoms resembling those of myxœdema follow the operation.

13. Prof. P. Bruns (Tübingen) has in no case in which parts of the thyroid gland have been left behind seen any abnormal changes. The investigations extended to patients operated upon twenty years before. No details as to the number of the cases are given.

14. Dr. Burckhardt (Stuttgart) has in none of the numerous partial intracapsular extirpations which he has performed since 1884 seen symptoms of cachexia strumipriva follow.

15. Dr. Credé (Dresden) has performed 40 partial extirpations without any symptoms of cachexia following the operation.

16. Prof. Czerny (Heidelberg) does not give the exact number of his partial extirpations. Apparently no myxœdematous symptoms followed after any of them.

17. Dr. Eugen Hahn (Berlin) has performed 9 partial extirpations. In one case the patient was lost from observation. Of the remaining 8, in 2 frequent headaches with symptoms of excitement and fear, and in 1 numbness in different parts of the body, followed the operation. "In one case, that of a woman æt. about 40, very distinct symptoms of cachexia strumipriva occurred. Death took place several months after operation with signs of constantly increasing mental and bodily weakness. The post-mortem examination showed grey degeneration of the posterior columns. A fuller examination of the spinal cord, which has been preserved, will be made and published."

18. Dr. Hoffmann (Cologne). Two partial extirpations. Both patients continue well.

19. Prof. König (Göttingen). Seven partial extirpations. Nothing known about the existence of accessory thyroids. No further details given.

20. Prof. E. Küster (Berlin). Thirty-two partial extirpations. All the patients but two were seen or heard of at periods from one half to four years after operation. All had remained well.

21. Prof. Madelung (Rostock). Three partial extirpations without any untoward sequelæ.

22. Prof. Mikulicz (Königsberg) has in 28 cases either extirpated one lobe or "resected" both lobes, *i. e.* left a part of the gland of about the size of a chestnut behind, in the angle between the trachea and œsophagus, by which means the inferior thyroid artery and the recurrent laryngeal nerve are to a certainty left intact. In none of these cases did any symptom of systemic affection follow the operation.

23. Prof. von Nussbaum (Munich) has performed 45 partial extirpations, availing himself of very various methods of

operation. Seven patients died; the other 38 recovered and remained well. He had often had an impression as if the parts which were left behind underwent some atrophy after the operation; at any rate they did not increase.

24. Dr. Riedel (Aix-la-Chapelle) has performed 22 unilateral extirpations; in a few cases also larger or smaller portions of the remaining half were removed, but somewhat large parts were always left behind. Besides Dr. Riedel has operated on two aberrant goitres and several cysts. In none of these cases of partial operation was any symptom of cachexia strumipriva observed.

V. *Great Britain and Ireland.*

25. Mr. A. E. Barker (London). One partial extirpation. Patient quite well several years after operation.

26. Mr. Astley Bloxam (London). Two partial extirpations. In the first case "almost the whole of the gland" was removed. Patient was a married woman æt 31. Date of operation May 22nd, 1884. When seen again in May, 1887, her general health was very good; no signs of myxœdema were present. "The portions of gland left have hypertrophied and are now about the size of a small marble." In the second case the patient was a married woman æt. 40. On June 5th, 1884, "the greater part of the gland" was removed. When Mr. Bloxam saw the patient about a year after the operation she was enjoying good health, and there were no signs of myxœdema. [The cases have been described in detail in the 'British Med. Journal," August 28th, 1886.]

27. Mr. T. B. Chavasse (Birmingham) has performed 3 partial extirpations. All three patients were women aged 38, 21, and 29 respectively. All three recovered, and the first two who were operated upon in 1884 were recently seen in good health, and showing no sign of myxœdema. In the third case the operation was performed in 1886. It is not stated when the patient was last seen. [Mr. Chavasse refers to his experiences in the 'Lancet' July 18th, 1885.]

28. Mr. Kendal Franks (Dublin) has three times removed one lobe of the thyroid in women. All the patients recovered. Two of the operations had been performed more than a year before the time of the communication, one about nine months before. The patients were all in perfect health, and showed no sign of myxœdema.

29. Mr. Sydney Jones (London), who has in several cases resected the isthmus of the thyroid gland, which operation was followed by some atrophy of the lateral lobes, writes to say that he has had difficulties in getting notes of his cases, but that, so far as he has been able to follow them, no damage had been done by this partial removal.

30. Sir Joseph Lister (London). One extirpation, which was apparently intended to be complete, but in which it is stated that probably not all parts of the tumour were removed. The operation was performed in the Edinburgh Royal Infirmary on a woman æt. 26, for exophthalmic goitre on July 18th, 1877. The patient recovered. In June, 1887, she was again in the Infirmary under Dr. Fraser with phthisis, and the following note was sent: "At present the exophthalmos is only slight, the excitement of the circulation has nearly gone, and there is no thyroid tumour: the two lobes are certainly absent, but there is a slight eminence in the position of the isthmus, which suggests that possibly you did not remove the isthmus. . . . . There is no symptom of myxœdema now to be found."

31. Mr. Bennett May (Birmingham). One partial extirpation. [Removal of right lobe and isthmus.] Patient, a woman æt. 35, is now, *i. e.* three years after operation, quite well. ['Birmingham Med. Review,' November, 1884.]

32. Mr. W. D. Spanton (Hanley). "Four cases of partial extirpation or removal of the isthmus have all recovered, and so far as I know not one has been followed by any ill-effects. . . . . In two of them the gland almost entirely disappeared subsequently, in the others diminished to a large extent."

33. Sir William Stokes (Dublin). One case of resection, and one of division of the isthmus, both followed by shrinking

of the lateral lobes and permanent good results in the first case (that of a young female), while in the second (that of a youth æt. 15) his condition was quite satisfactory when he was seen last, *i. e.* five months after operation. [See 'Brit. Med. Journal,' October 16th, 1886.]

34. Mr. Horatio P. Symonds (Oxford). "Three partial extirpations; in two removal of both lobes, leaving the isthmus; in a third, removal of one lobe only." No symptoms of cachexia strumipriva followed. [See George Rodman, "A Case of Excision of the Thyroid Gland," 'Lancet,' May 1st, 1886.]

VI. *Holland.*

35. Dr. van Iterson (Leyden). One partial extirpation. The patient was a young woman, æt. 22. No myxœdema followed. [See 'Nederlandsche Tydschrift vor Geneeskunde,' 1886, p. 92.]

VII. *Russia.*

36. Dr. Knie (Moscow). Three cases of partial extirpation, 4 cases of intra-glandular enucleation, all in women. The patients have been kept under observation. In no case have signs of myxœdema shown themselves.

37. Dr. Zander (Perm). Seven partial extirpations with recovery. Further fate of patients unknown, with exception of the two last operated on, in whose cases the operation had been too recently performed to admit of any conclusions.

VIII. *Sweden and Norway*

38. Prof. John Berg (Stockholm). Nine partial extirpations or intra-glandular excisions, 3 of which were quite recently performed. In no case was myxœdema observed to follow the operation.

39. Prof. Rossander (Stockholm). Five partial extirpations, one of which ended fatally. No myxœdema observed in the other 4 cases.

IX. *Switzerland.*

40. Dr. Feurer (St. Gallen). Thirty-six partial extirpations in patients from nine to fifty-six years old. One of these patients was attacked by cachexia strumipriva. Her case is as follows :

"Ida Kreis, of St. Gallen, æt. 17, entered the hospital in March, 1882, on account of a goitre which had been six years in existence and caused dyspnœa for five years. She was of small size but mentally well developed. On March 22nd, 1882, the colloid goitre, which was centrally situated and was the size of a small apple, was removed together with a node of the size of a walnut, which was situated on the left side and had also undergone colloid degeneration. The girl, who had regularly menstruated since the end of 1884, remained well until October, 1885. In this month she re-entered the hospital on account of a goitre situated at the right side which had made its appearance since the beginning of the year. This was extirpated on October 28th, 1885, and was found to be a colloid goitre, honeycombed by cysts the diameter of which was 9½ by 8½ cm.

"On February 25th, 1886, the girl put in an appearance again. She had so far worked as fitter-out for articles of embroidery; since the middle of the month, however, she could no longer work, had become quite devoid of energy, was 'weak,' could not make on foot the twenty minutes' walk to the surgeon; states that she had never been quite well nor had had good appetite since the last operation. Her fellow-workers state that she was no longer what she had been and that she had entirely lost her former vivacity. She slept much, and had in the course of the winter repeatedly œdema of the face and legs. No albumen in the urine. Heart normal. The face looked puffy and less intelligent. Neck broad and relaxed, skin thick and tumid, mucous membranes pale.

"To the left of the trachea the rest of the left lobe of the thyroid gland, which has the size of a hazel-nut and has under-

gone goitrous degeneration, can be felt. This node increased up to December, 1886, to the size of a plum.

"The œdema of face and legs came and went, otherwise the state of things has remained unaltered. The patient, though alive, is incapable of doing work.

"I look upon the whole as an instance of cachexia strumipriva, and consider the case remarkable because—

"(*a*) The extirpation was performed in two acts with an interval of more than three years.

"(*b*) Because a small portion of the goitre remained certainly behind and could be both seen and felt.

"This is the only case of cachexia strumipriva observed in my practice."

41. Dr. Fritzsche (Glarus) has performed 2 partial extirpations without ever seeing signs of myxœdema follow the operation.

42. Dr. Ch. Girard (Berne), who has kindly forwarded very full particulars of 34 cases of partial extirpation performed by him—particulars, which for reasons stated in the beginning of this report, we must reluctantly refrain from publishing here—has in 2 only of these cases seen remarkable anæmia after operation. The patients, however, neither in the mental nor in the physical aspect, showed any symptoms characteristic of myxœdema, but merely those of genuine anæmia (ready fatigue, disinclination to work, diminished vivacity, &c.), and entirely recovered under the use of iron and suitable diet within two months. In one case the patient, a female æt. 24, was already, before the operation, "half cretinoid, dwarfy, with nose sunken in, and of somewhat myxœdematous appearance." In her case about one year after extirpation of the isthmus goitrous degeneration of the left lobe took place, which, however, did not necessitate repetition of the operation. In all other cases in which comparatively large portions had remained behind, they, after a short time, shrunk to a very small size, not so much, Dr. Girard believes, in consequence of the operation as in consequence of the treatment of the wound by means of iodoform.

43. Dr. Kappeler (Münsterlingen). Fifty-four partial extir-

pations with 51 cures and 3 deaths. In no case were symptoms referable to cachexia strumipriva observed. Seventeen patients were under twenty.

44. Prof. Kocher (Berne) writes: "In a few instances I have seen slight indications of cachectic phenomena in cases of partial extirpation. They were, however, such that the question could still have been discussed, whether not merely anæmic or otherwise caused symptoms were present. One single time I have seen a plainly marked case of cachexia after unilateral excision. The small size of the lobe which was left behind attracted attention—it is true, too late—already during the operation itself, and the further course showed that this lobe was atrophic."

45. Dr. A. Kottmann (Solothurn). Twenty-four partial extirpations with one death from very acute septicæmia. In no case were any symptoms of cachexia strumipriva observed.

46. Prof. J. L. Reverdin has seen 2 instances of what he denominates as "myxœdème fruste," *i. e.* abortive or attenuated myxœdema [see A 49] in 7 partial extirpations. In one of these cases, that of a lady æt. 30, operated upon on October 11th, 1883, after extirpation of the right lobe, hoarseness, nervousness, restlessness, and greater weakness than could be expected considering the rapid recovery from the operation, came on and persisted for several months. In the other case, that of a lady æt. 23, from whom on January 21st, 1884, the left lobe of the thyroid was removed, the symptoms were more marked, and consisted in dysmenorrhœa, sense of fatigue, want of appetite, nausea, pallor, nervous crises, sensation of cold in hands and feet, gastralgia, &c. All these symptoms, however, disappeared about the month of January, 1885. When examined in October, 1886, the right lobe, which had been left behind, appeared to have undergone some atrophy.

Prof. Reverdin mentions another case of his own, in which the symptoms were limited, it appears, to coarseness of the features, which had supervened after operation, and refers to the cases of Prof. Poncet [see B 9] and Dr. Girard [see B 42], as well as to others reported by Dr. Niehans, of Berne, and Drs. Schulthess and Lüning, of Zurich, in which remarkably tardy

recovery from the effects of otherwise very successful partial extirpations is stated to have taken place, the patients remaining for a long time curiously dull, weak, somnolent, and pale. No details, however, are given of these cases.

47. Dr. Roux (Lausanne) has performed 2 partial extirpations, which were not followed by signs of cachexia strumipriva.

48. Dr. Carl Schuler (Rorschach) has in the 2 cases in which he performed partial extirpation sufficiently long ago to permit of drawing conclusions before replying to our questions, not seen any cachectic symptoms follow. On the contrary, in the first of his cases, in which severe anæmia existed before operation, this got immediately better afterwards. The patient was a female æt. 20.

49. Prof. Socin (Bâle) has performed 17 partial extirpations, 2 in men, 15 in women, of the ages of fifteen to fifty-eight years. All the patients recovered. Six cannot be found; in the other 11 (1 man, 10 women), no symptoms whatsoever of cachexia strumipriva can be detected on the most careful examination. They all have remained well. [In all his other numerous cases of operation for goitre, Prof. Socin has performed intra-glandular enucleation, which he looks upon as the typical procedure to be followed.]

50. Dr. Wiesmann (Herisau) has performed 9 partial extirpations in 4 men, whose ages varied from thirteen to forty-four, and 5 women, whose ages varied from eighteen to sixty. One of the male patients was a deaf-mute cretin. The removal of the gland was in most cases nearly complete, but some small pieces were intentionally left behind. In no case did cachexia strumipriva occur. [In the case of one woman æt. 20, after the operation, first aphonia, afterwards transitory paralysis of the glottis-openers, later on again curious attacks of dyspnœa without stridor, with increased frequency of pulse and somnolence, occurred. These attacks became gradually more frequent, up to four per diem, and lasted from five to ten minutes. Later on, however, they got gradually more infrequent, and have now ceased altogether.] Some other extirpations of Dr. Wiesmann's are of too recent a date to be utilised here.

In addition to these cases of partial extirpation of goitres, for which we are indebted to the authors themselves, it must be mentioned that—

51. Prof. Julius Wolff (Berlin) has found in 9 extremely carefully observed partial extirpations ["Weitere Beiträge zur Lehre vom Kropf," 'Berliner klin. Wochenschrift,' Nos. 27 and 28, 1887] that in none of these cases hypertrophy of the rest of goitre left behind occurred, and that in four of them, in which the goitre was simply of the hyperplastic variety, the rest even underwent a very considerable retrogressive change, so that finally the normal size of the non-operated side was re-established. In all these four cases the patients continued to enjoy the best of health.

From these replies, and other material collected in the above lists, the following conclusions can, it appears to us, be drawn at once:

That there is an affection, following, in a certain number of cases, total, and in a much smaller proportion, partial extirpation of the goitrous thyroid gland in man, which is clinically identical with primary myxœdema. As in the primary disease, the symptoms are not always equally well developed in the operative variety, and in this respect important differences appear to obtain between the cases of total and those of partial extirpation of the goitrous gland. The only real addition, however, to the symptoms of the primary malady, which sometimes occurs in the operative variety, when the operation has been performed on children, viz. the stunting of the growth of the body, finds its natural explanation in the fact that primary myxœdema almost always attacks persons in whom the period of evolution of the body has been completed. At the same time it must be remarked, that sporadic cretinism, in which marked arrest of growth and development forms one of the most prominent symptoms, is probably to be regarded as the infantile form of myxœdema.

Another apparent difference between the two varieties, viz. the tendency to improvement or even to complete disappearance of the cachexia in a certain number of cases of operative myxœdema,

seems to be due, so far as we can conclude from the few hitherto carefully observed cases, to the fact, that in these cases the operation was either not total after all, or that accessory thyroids existed, and that in either case a late *hypertrophy of the remnants of thyroid tissue with resumption of the function of the thyroid occurred.*

Of the pathological identity or otherwise of the two varieties, however, it is impossible to speak as yet with any certainty, because the number of post-mortem examinations made in cases of operative myxœdema is very small, viz. 8 : 1 case by Bruns, 1 by Fritzsche, 3 by Kocher, 1 by Reverdin, 1 by Wolkowitch, 1 by Hahn ; *and because in the four instances in which somewhat fuller details are known to us* (Bruns', Hahn's, Reverdin's, and Wolkowitch's) *no pathognomonic lesions appeared to have been detected.*

Such are the general conclusions, which result from a perusal of the evidence at our disposal in which examples illustrating the fully-developed as well as the more abortive forms of operative myxœdema will be found, whilst in many instances we have been merely assured that the appearances were "typical," a reply which is the more significant when it is remembered that to our questions a brief account of primary myxœdema and a photograph of a typical case of this malady were appended.

It need hardly be pointed out that the conclusions so far arrived at contain nothing new, and merely corroborate the statements made by Prof. Reverdin and the inferences drawn by Dr. Semon from Prof. Kocher's paper four years ago.

Considering now that the only lesion found without exception in the autopsies of cases of primary myxœdema consists, according to the report of our pathological sub-committee, in total atrophy or degeneration of the thyroid gland, the question which immediately arises is this :

Are the symptoms observed after total and partial thyroidectomy in man a direct consequence of the loss of the function of the thyroid gland ?

It may at once be pointed out that the occurrence of an attenuated form of cachexia strumipriva in a certain number

of cases of partial thyroidectomy does not, in itself, necessarily militate against the idea of the myxœdematous sequelæ being due to loss of the function of the thyroid. For it would be theoretically quite conceivable that in such cases the part left behind was either so completely degenerated that the partial extirpation was equal in its effects to total extirpation in other cases, or that, at any rate, the still functionally active parts of the gland left behind were too small to compensate for the loss of its greater part, and that only later on, when these parts had undergone a certain amount of hypertrophy, a partial resumption of the functions of the thyroid could take place, accompanied by more or less improvement in the symptoms. This idea, which has been enunciated by Prof. Reverdin, certainly finds a strong support in the clinical history of several of the cases observed by him [see A 49 and B 46].

If, on the other hand, the cachexia were really due to the loss of the functions of the thyroid gland, it would be a necessary logical conclusion that in all cases of total extirpation of the gland cachexia strumipriva or operative myxœdema should unavoidably follow.

Now, if we investigate the evidence at our disposal with regard to this question, it would seem at first sight that the facts absolutely negative such an idea, for only one observer (Kocher) has seen the cachexia as a regular sequel of total extirpation; a few other observers (Baumgärtner, Reverdin, Gussenbauer, Mikulicz, Paul Bruns) have observed it in a considerable fraction of their cases, whilst the great majority of those surgeons who have performed the operation have either met with isolated instances only, or have, in spite of large experience (Billroth, v. Nussbaum, Bottini, Bardeleben) either not at all seen the cachexia follow, or at any rate only in its most attenuated form.

On closer examination, however, it will be seen that the matter is not at all so simple as would appear at first sight, and that its investigation offers very great difficulties.

The main sources of error which are here met with, may be dealt with under the following headings:

(1.) Was the operation in all the cases which are reported as

instances of "total" extirpation, really complete, *i.e.* did no part of active thyroid tissue remain behind?

(2.) Is it certain that no accessory thyroid glands were presentin those cases in which, in spite of really total extirpation, no myxœdema developed?

(3.) Were the patients who are reported as doing continuously well, long enough under observation to be quite certain that no myxœdema would develop later on?

(4.) Are cases in which the patients were merely *heard of*, not personally re-examined,—strictly taken—admissible for statistical purposes?

(5.) Does even personal examination secure infallibly against mistakes concerning the absence of active thyroid tissue?

It will at once be seen that all these questions have arisen from the investigation of the material placed at our disposal.

(1.) As to the question concerning the completeness of the operation, nothing appears to us more striking and more important than Prof. Wölfler's report concerning Prof. Billroth's results [see A 6]. It is well known that Prof. Billroth's negative experience, based upon so large a number of operations, has always been pointed to by those surgeons who are disinclined to believe in a connection between the loss of the functions of the gland and the cachexia, as a valid proof against this connection. But now it is stated by Prof. Wölfler that out of the twenty-two patients of Prof. Billroth's, who are still living and whose cases could be utilised for the present inquiry, one suffers from tetany, one from tuberculosis, 2 from conditions which resemble slight symptoms of cachexia strumipriva, whilst of the remaining 18, who have remained well, at least in 7, if not in 9, "recurrence" of the goitre is stated to have taken place! Yet all these cases are distinctly reported as instances of "total" extirpation of the thyroid gland.

Considering that a real regeneration of thyroid tissue in persons, all of whom had passed the age of puberty, appears so unlikely an event as to be almost entirely excluded, it appears to us to follow unavoidably from the fact of the recurrence of the goitre, that in all these cases either the

extirpation cannot have been complete, though it was at the time supposed to be, or that accessory thyroid glands, the presence of which was not suspected, had undergone hyperplasia. These cases represent at least 39, if not 50, per cent. of Prof. Billroth's entire experience. We also wish to draw, in this respect, attention to the statements of Prof. Paul Bruns [A 13], who detected that in one of his cases the operation had, "after all, not been complete;" of Mr. T. H. Morse [A 33], in whose case it is at least doubtful whether the whole gland had been removed; of Prof. E. Dionisio [A 38], in whose second case recurrence after apparently total extirpation necessitated a new operation; of Prof. John Berg [A 42], in whose 6 cases the excision "was total or at least believed to be so; in one of these the patient has got a new goitre;" of Prof. Kocher [A 46], who leaves it an open question whether in his 6 cases of intended total extirpation in which no myxœdematous sequelæ followed, but in which recurrence took place, this recurrence was due to "left-behind remnants of thyroid tissue," or to the development of goitre in accessory thyroid glands; of Dr. A. Kottmann [A 47], who saw recurrence one year after apparently total excision; of Prof. Reverdin [A 49], whose opinions concerning the recurrence in two of his cases coincide with those of Prof. Kocher; and of Sir Joseph Lister [B 30], in one of whose cases the operation was apparently intended to be complete, but in which "probably not all parts of the tumour were removed."

In view of all these statements, but more especially of Prof. Billroth's very remarkable experience, some suspicion would appear to be justified that a similar recurrence might have taken place in other instances as well, in which the reports do not mention the question of recurrence, and merely state that the patients have remained well. On the other hand, it must not be overlooked that a comparatively large number of our correspondents state that they are certain of the completeness of their operations (Kraus, Bardeleben, Baumgärtner, Credé, Hopmann, Riedel, Feurer), and that of these, in Kraus', Bardeleben's, Credé's, and Feurer's cases, no operative myxœdema followed at all the total extirpation, whilst in Baum-

gärtner's, Hopmann's and Riedel's experience this sequel was limited to a greater or smaller fraction of their cases.

(2.) An even greater uncertainty than with regard to the question of the completeness of the operation obtains with regard to the presence or otherwise of accessory thyroid glands. Against a few well-authenticated cases, in which accessory thyroid glands were already noticed at the time of the operation [as possibly in Sir William Mac Cormac's case, see A 56], or developed later on, as in cases of Prof. Madelung [A 21], Prof. Kocher [A 46], Prof. Reverdin [A 49], there is a large number of statements to the effect that no accessory thyroids were observed at the time of the operation, and none were noticed on re-examination months or even years after the operation.

It must, however, be observed that the degree of positiveness with which these statements have been made very considerably varies. Thus whilst one of the most experienced thyroidectomists [Prof. v. Nussbaum, A 24] admits the possibility that he may occasionally have left behind accessory glands, which did not come into view during the operation, and whilst others merely say that nothing was known with regard to the existence of accessory glands in their cases [Prof. König, A 19], or that they had no reason to believe that in the cases which remained well, accessory glands had been left behind [Prof. Mikulicz, A 22], other observers simply state that accessory glands—though in some instances sought for—were not encountered during the operation [Prof. Poncet, A 10, Prof. Bardeleben, A 11, Dr. Hahn, A 17, Dr. Riedel, A 26, Prof. Socin, A 51], and again a number of operators believe firmly, or even are certain, that there were none [Dr. Kraus, A 4, Dr. Baumgärtner, A 12, Dr. G. Feurer, A 43].

In view especially of this last category of statements, attention must once more be drawn to Prof. Reverdin's experiences [A 49]. It having been conclusively shown that aberring pieces of thyroid tissue, of the existence of which nothing at all was known at the time of the operation, underwent, in some instances at least, compensatory hypertrophy at a period at

which the majority of cases from which our material is composed had passed out of the observation of the surgeons who report them, some caution is obviously needed in accepting statements concerning the non-existence of accessory thyroids as absolutely conclusive.

But this question must be followed up somewhat further from the anatomical point of view. The literature accessible to us, which deals with the question of the frequency of accessory glands, is a rather small one, and the observations of the various anatomists who have studied this question vary very considerably indeed; but if we look at the very small number of references to the existence of accessory thyroids in the reports of our correspondents, and compare them with the statements even of those anatomists who have been least successful in discovering accessory or aberring thyroid glands, it will be seen that a surprising disproportion exists between the frequency of accessory thyroids actually observed during or after operation, and the frequency which was to be expected even according to the smallest anatomical estimation.

Whilst already several of the older anatomists, such as Luigi Porta and Rokitansky,* speak of the frequency with which accessory thyroid glands are found in the neighbourhood of the thyroid body, the first statistical dates are given by Bruch.† He found, in eighteen careful dissections made in the dissecting room of the University of Bâle, five times accessory glands in the neighbourhood of the thyro-hyoid muscle, *i. e.* in nearly 28 per cent. Wenzel Gruber,‡ who has derived his conclusions from a very large material, divides the glandulæ thyreoideæ accessoriæ into superiores, inferiores, and posteriores, the two first of these groups being further subdivided into medianæ and laterales. He had previously, by means of "mass-examinations," found that in Czech bodies superior accessory thyroids existed in $\frac{1}{50}$, *i. e.* in 2 per cent. of

* Quoted from Prof. Madelung's above-mentioned paper [see A 21], in which most interesting details on the localisation of aberring thyroids will be found.

† 'Bericht über die Verhandlungen der naturhistorischen Gesellschaft in Basel,' x, 1852. Quoted from Madelung.

‡ "Ueber die Glandula thyreoidea accessoria," 'Virchow's Archiv,' vol. lxvi, 1876, p. 447, *et seq.*

all cases. Having in the meantime been transferred to St. Petersburg, he resumed his investigations in consequence of Bruch's surprisingly large percentage, and found in 300 Russian bodies, which he examined with regard to the presence of superior accessory thyroids only, 23 such superior accessory thyroids, *i. e.* in about $7\frac{1}{2}$ per cent. of all casss. Gruber himself says on this point: "Amongst 300 larynges with glandulæ thyreoideæ and other annexa (250 male, 50 female) superior accessory thyroids were found in 23, 18 of which were male, 5 were female. The proportion of the presence of the accessory gland to its absence in general, would be as 23 : 277 = 1 : 12·043; in males, as 18 : 232 = 1 : 12·888; in females, as 5 : 45 = 1 : 9.

"The accessory gland would therefore have to be expected, if no consideration be taken of the sex of the individuals, in $\frac{1}{13}$ of all cases; in males in $\frac{1}{13}$ to $\frac{1}{14}$ of all cases; in females in $\frac{1}{10}$ of all cases. In the face of the abundance ascribed by Bruch to the Bâle people the Russians are very poor, but richer than the Czechs. I have found in the examination respectively of 10, 11, 13 larynges in each series twice an accessory gland, once thrice in 15 larynges. On the other hand I had to examine 7, 10, 11, 13, 14, 15, 17, 18, even 44 to 45 larynges with annexa in order to find in each series one accessory gland. If Bruch's statement were correct I ought to have found the glandula accessoria, instead of 23 times, in a number approaching that of 68 to 70."

In a footnote Prof. Gruber enters further upon a polemic against Bruch, which is the more surprising as the disproportion which he himself found between the frequency of the glands in Czechs and Russians, viz. in $\frac{1}{50}$ and $\frac{1}{13}$ of the cases respectively, is certainly just as great as the disproportion between his own numbers as given for Russia ($\frac{1}{13}$), and between Bruch's Swiss frequency ($\frac{4}{18}$).

Further on Prof. Gruber tells us that in an investigation of 100 individuals (84 males and 16 females) whose ages varied from 5 to 84 years, he had found *lateral inferior* thyroid glands in 10 instances. . . . They occurrred, therefore, in $\frac{1}{10}$ of all cases.

It is much to be regretted that on no occasion it is stated in plain words in Prof. Gruber's otherwise excellent paper what is the average frequency of accessory thyroids *in general*, without special reference to their situation. Thus we are left entirely in the dark about the question whether in his first 300 cases, which were to all appearances only examined concerning the existence or non-existence of superior accessory thyroids, there were additionally inferior or anterior or posterior accessory glands. To conclude from his second series, in which lateral inferior accessory glands were found in not less than 10 out of 100 corpses, which were examined with regard to this special point, there ought to have been in his first series of 300 cases 30 such instances, and even if it be granted that probably in several cases there may have been a simultaneous occurrence of both superior and lateral inferior accessory thyroids, yet it would follow that the total frequency of accessory thyroids in his own collection did not, after all, very materially differ from that indicated by the much smaller number of Bruch's observations. As this point, viz. the question of the total frequency of the occurrence of accessory thyroids, is of fundamental importance for our inquiry, we can but repeatedly express our regret that just in this question we have to depend upon theoretical calculations.

The last paper which here, so far as we know, comes under consideration, is Streckeisen's ["Beiträge zur Morphologie der Schilddrüse," 'Virchow's Archiv,' vol. 103, Hefte 1 and 2]. This author's experience concerning the frequency of superior accessory thyroid glands corresponds, according to his own statements (loc. cit., p. 137), much more to Bruch's than to Gruber's results. He found in 153 cases twenty-five times, *i. e.* in 16·3 per cent. or in $\frac{1}{6}$ of all cases, superior accessory thyroid glands. With regard to sex he states that they were present in males in about $\frac{1}{5}$, in females in about $\frac{2}{15}$ of all cases. Besides this Streckeisen found, as indeed Zuckerkandl ["Ueber eine noch nicht beschriebene Drüse in der Regio suprahyoidea,' Stuttgart, 1879] and Kadyi ["Ueber einige accessorische Schilddrüsenläppchen," 'Archiv für Anatomie und Physiologie,' 1879, Anat. Part., p. 312] had found before

him, that in 36 out of 130 cases, *i. e.* in 27 per cent., there were small lobules of thyroid tissue close and often adherent to the hyoid bone. (Zuckerkandl had found these lobules in 57 out of 200 cases.) In the discussion on this subject, for which the original must be consulted, Streckeisen further states (loc. cit., p. 232) that in 10 cases, taken at random, in which fœtuses and the bodies of newly born children were examined, a pyramidal process of the thyroid, or a superior accessory gland compensating for its absence, was found 9 times, remnants of thyroid tissue in front of, and on, the hyoid bone 5 times, *i. e.* in 50 per cent. "This high proportion may in part be due to accident, but it is a hint that the number of 27 per cent., found microscopically as showing the frequency of the suprahyoid gland, is probably too small."

From the foregoing quotations, differing as the results of different observers are, one thing is clear, viz. that the frequency of aberring or accessory glands is a very considerable one. It is to be desired, in the interest of physiology and surgery, that by renewed investigations based upon large material some certainty were to be gained as to the frequency of accessory thyroids in general, irrespective of their special localisation. That aberrant particles of thyroid tissue occur in situations in which they would be least expected, is amply shown by the anatomists just quoted, and, from a surgical point of view, by Madelung's excellent paper above referred to. But no definite statements, so far as we are aware, have as yet been made concerning the point which is most important for the present inquiry, viz. the question what is the proportion of those cases in which the whole of the thyroid tissue of the body is represented by the main gland alone, to those in which accessory thyroid tissue is found in any part of the neck ?

If, for the present, we accept the minimum results of the three statistics just mentioned, viz. Gruber's, we should, reverting now to our surgical reports, expect that in at least $\frac{1}{13}$ of all cases accessory thyroids should either have been observed at the operation, or possibly have afterwards given proofs of their existence by undergoing hypertrophy. But, as has been shown at the beginning of this paragraph, in 10 cases

at the outside* [Mac Cormac's, Madelung's, Kocher's, Reverdin's] has the presence of accessory thyroids been ascertained or even been merely rendered likely, while the aggregate number of those patients who recovered from total extirpation performed for benign goitres, amounts to 298. In other words, *de facto,* in $\frac{1}{30}$ of all cases only have accessory thyroids been observed, whilst, according to the lowest anatomical computation, they ought to have been present more than twice as often.

Considering the immense importance which, from physiological experiment (Horsley, Fuhr) and from pathological observation (Kocher, Reverdin), we are entitled to attribute to the question, whether really all thyroid tissue has been removed, or whether active gland tissue, even if but little, has been left behind, it will, we think, be generally admitted that here a difference remains unaccounted for, which can on no account be lightly passed over, and which seriously diminishes the value of all statistical conclusions drawn from our material.

(3.) With regard to the question whether the patients, who have been reported as doing continuously well, had been long enough under observation to be quite certain that no myxœdema would develop later on, we regret that no greater stress was laid upon this point in our original circular. In very many of the replies given to us no definite time is mentioned, during which the patients had remained under observation, and on closer examination it would probably be found that a good many had been lost from observation before they had passed the critical stage, or had not yet passed it at all, when the reply was sent to our circular. Two good illustrations of the former contingency are given in Dr. Riedel's report [A 26], of the later fate of one of his own and one of Prof. König's [A 19] patients. As to the duration of the critical stage, Prof. Socin's case [A 51] shows that Dr. Baumgärtner's experience [A 12], viz. that unless the signs of cachexia strumipriva have developed after the lapse of one year they will not

* It must be remembered that Kocher [A 46] leaves it uncertain whether the absence of cachexia in six of his cases is due to hypertrophy of remnants of the main body, which were unintentionally left behind, or of accessory glands.

occur at all, though doubtless correct on the whole, yet must not be accepted as uncontrovertible. In this remarkable case the more pathognomonic signs of operative myxœdema only developed three to four years after operation. It is certainly possible that, just as Prof. König's and Dr. Riedel's cases had nearly figured in our lists as cured, and free from cachexia, thus there may be more than one instance actually in our list in which the patient, who has *bonâ fide* been reported as doing well, is in reality myxœdematous.

(4.) On touching upon the question whether cases in which the patients have been merely heard of but not personally re-examined, ought, strictly taken, to be admitted for statistical purposes, we come in part back to points (1) and (2). In such cases even the criterion of deciding, by later digital examination, whether really the whole of the gland has been removed, and whether accessory thyroids have undergone hypertrophy, is wanting, and the possibility of mistakes the greater. Prof. Kocher's communication [A 46] shows that this is more than a mere theoretical danger; in some of his patients who had formerly reported themselves as going on well, and who were, indeed, when he re-examined them, found to be well, recurrence of goitre was detected (starting either from glandular tissue not removed or from accessory thyroid glands), of which the patients had been unaware themselves, and therefore unable to mention anything about it in the former reports they had sent to him. Here then is a further fertile source of error. And it must be added that, since we have learned from more recent experience that there is an "abortive" form of cachexia strumipriva, in which not all the symptoms are developed, and those which are but to a slight degree, it is quite possible that some of the patients who send in satisfactory accounts of their state of health may suffer from the slighter forms of the affection without being aware that the small troubles to which they are subject are in reality consequences of the operation.

(5.) Finally, we believe that just those who have the largest experience in these matters will admit that even personal re-examination does not infallibly guard against mistakes

concerning the absence of active gland tissue. In persons with a somewhat richly developed panniculus it is often exceedingly difficult to pronounce with certainty as to the presence or absence of the normal thyroid gland, and—considering the usually small size and often capricious localisation of hypertrophic remnants of the main body or of aberring hypertrophic accessory glands—it is no exaggeration to say that occasionally such a compensatory hypertrophy may escape the notice of even the most careful and most experienced observer. Due stress is laid upon the difficulty thus arising in Prof. Julius Wolff's above-mentioned careful paper [B 51].

Considering the multiplicity of the provisos necessary to make each case really complete, considering, further, the fact that the necessity of most of these provisos only became apparent during the study of the replies kindly sent to us, and that therefore several of the questions asked in our circular were not so strictly formulated as they would be now if we had to send it out again, it is but natural that only in the minority of the replies all those conditions have been fulfilled which, according to rigorous principles, exempt the cases communicated in them from all doubt.

Under these circumstances the question naturally arises: Is our general material suitable for statistical utilisation, or, if not, ought the statistical inquiry to be limited to those cases in which all the provisos have been satisfactorily answered?

From a strictly scientific point of view the latter alternative would appear to be preferable; if not, on the other hand, the curiously contradictory character of the experiences of single observers showed at once that a rigorous selection would almost certainly lead to erroneous results. For it must be remembered here that the position of matters is not such, that every surgeon who has performed a good number of thyroidectomies has seen a certain more or less similar percentage of instances of operative myxœdema follow, so that it would be merely the question: What is the average of this percentage?—but stands thus, that whilst one surgeon has seen this sequel regularly and some others in a goodly proportion of

their cases, there are others of equally large experience who strenuously deny its very existence.

It would, under these circumstances, be obviously unfair and would materially influence the results of any attempt at numerical utilisation of our material if we were to exclude the experiences which may weigh heavily in the scale of any of our correspondents, for the reason that his reply was defective in one or another particular.

We have therefore decided to avail ourselves for the purposes of a statistical inquiry of all the material kindly placed at our disposal.

But we are perfectly aware ourselves that the result of this inquiry can only claim to give a sort of general idea of the question, and we would be the first to oppose the conclusion that it was of a decisive character. In view of the fact that total thyroidectomy is still practised by a good many surgeons, a later collective investigation, in which all the provisos demanding attention ought to be clearly stipulated when the questions are put, may, and probably will, lead to really decisive results.

The plan of the following tables explains itself. The signs of interrogation following many of the numbers merely imply that the statement in question is not absolutely certain. It must only be added that extirpations for malignant goitre have, for the sake of purity of the results, been excluded from the number of those extirpations upon which numerical calculations will be based. For although it is quite conceivable that after the total ablation of a thyroid gland, which is only in part in a state of cancerous degeneration and in part still contains active gland tissue, operative myxœdema may follow, still, in such cases the possibly simultaneous occurrence of operative and of cancerous cachexia may mar the characteristics of both and lead to doubtful results.

Total Extirpations.

Number corresponding to summary.	Name of surgeon.	Total number of operations.	Died from operation or shortly afterwards.	Extirpations for malignant goitre.	Recovered from operation for simple goitre.	Got recurrence of goitre or developed accessory glands.	Remained free from cachexia without recurrence or development of accessory glands, and remained sufficiently long under observation.	Got cachexia strumipriva.
1 (and 6)	Billroth . . .	46	6	...	40	9 (?)	9	2 (?)
2	Gussenbauer . .	17	1	3	14	...	4	5 (?)
3	Hofmokl . . .	1	...	...	1	?	?	?
4	Kraus . . .	1	...	...	1	...	1	...
5	v. Mosetig-Moorhof .	4	1	...	3	...	3 (?)	...
6	Wölfler (see 1) . .	...	...	...	...	...	...	...
7	Deschamps . . .	1	...	...	1	?	1 (?)	...
8	Hieguet . . .	4	2	...	2	?	1	...
9	Studsgaard . .	4	...	...	3	?	3 (?)	1
10	Poncet . . .	5	2	...	3	...	3 (?)	...
11	Bardeleben . .	15	5	2	10	...	10	...
12	Baumgärtner . .	14	3	...	11	...	6	5
13	Paul Bruns . . .	"Only a few"	...	...	3	...	1 (?)	2
—	Sick—Bruns . .	1	...	...	1	...	...	1
14	Burckhardt . .	3	...	...	3	?	3 (?)	...
15	Credé . . .	7	3	...	4	...	4	...
16	Czerny . . .	28	?	9	?	?	?	1—2 (?)
17	Hahn . . .	6	...	...	6	?	5	...
18	Hopmann . . .	6	1	1	5	...	2	1
19 (and 26)	König . . .	10	3	...	7	...	5 (?)	2
20	Küster . . .	8	3	2	3	...	2 (?)	1
21	Madelung . . .	1	...	...	1	1	...	...
22	Mikulicz . . .	7	...	...	7	...	5	2
23	Nieden . . .	1	...	...	1	...	1	...
24	v. Nussbaum . .	16	5	...	11	?	11 (?)	...
25	Rose—Pauly . .	1	...	...	1	...	...	1
26	Riedel . . .	4	1	...	3	...	1	2

27	Bramwell	1	...	...	1	...	1	...
28	Chavasse and Jolly	2	...	...	2	...	2 (?)	...
29, 30	Sir Joseph Lister—Gordon	Several	?	?	2	...	1 (?)	1
31	Bennett May	1	1	1 (?)	...	...	...	...
32	Henry Morris	1	...	...	1	...	1 (?)	...
33	Morse	1 (?)	...	...	1	...	1 (?)	...
34	Spanton	1	...	...	1	...	1 (?)	...
35	Sir William Stokes	1	...	...	1	...	...	1
36	Patrick Heron Watson	11 (?)	?	?	?	?	?	?
37	John Wood	1	...	...	1	...	1	...
38	Dionisio	2	...	...	2	1 (renewed operation)	2	...
39	Knie	3	...	...	3	...	3 (?)	...
40	Bornhaupt—Wolkowitch	2	...	...	2	...	1	1
41	Zander	1	1	...	...	...	...	...
42	John Berg	6 (?)	2 (?)	...	4 (?)	1	3 (?)	...
43	Feurer	2 (?)	?	...	2	...	2	...
44	Fritzsche	1	...	...	1	..	...	1
45	Kappeler	8	6 (?)	1	2	...	?	1 (?)
46	Kocher	? over 35	?	?	32	6	...	26
47	Kottmann	8	1	...	7	1 (renewed operation)	6	1
48	Kuhn	7	...	...	7	... (?)	7 (?)	...
49	T. L. Reverdin	18	3	...	11	2	6	5
50	Roux	2	...	1	1	...	...	1
51	Socin	5	1	...	4	...	3 (?)	1
52	Vouviller (see 46)	...	...	...	...	...	...	...
53	Wiesmann	6	...	...	6	...	6 (?)	...
54	Bottini	52	8	...	44	...	44 (?)	...
55	Julliard	10	?	?	8 (?)	?	8 (?)	2
56	Sir W. Mac Cormac	1	...	...	1	1 (?)	...	...
57	Omboni	3	...	...	3	...	3 (?)	...
58	Ruggi	5	?	?	3 (?)	?	3 (?)	2
	Total about	408	59	20	298	22	186	69

From this table the following results would appear to follow :

In a total of about 408 intentionally complete thyroidectomies, performed by 56 different surgeons, there were 59 deaths in consequence of, or shortly after, the operation.

In 20 cases the operation was performed for malignant disease of the thyroid gland.

Deducting the cases of death from or shortly after the operation, the cases in which there was malignant disease of the thyroid gland, and the cases which were lost from observation almost immediately after the operation, there remain 298 cases in which total thyroidectomy was performed for simple goitre and in which the patients are known to have fully recovered. Of these, in 277 instances the further fate of the patients could be followed up, with the result that in 22 cases in which the patients remained, or at any rate got well, either recurrence of goitre or development of accessory thyroid glands appears to have taken place; that in 186 cases the patients appear to have remained free from cachexia strumipriva without recurrence or development of accessory thyroids having taken place; and that in 69 cachexia strumipriva of a more or less severe type developed.

Before entering upon the last-named results, which for the purpose of the present inquiry are the most important ones, it may be well to investigate the age and sex of those afflicted with the cachexia. These two points are illustrated in the following table :

Age and Sex of Patients who showed symptoms of Cachexia Strumipriva after Total Thyroidectomy.

Number corresponding to summary.	Name of surgeon.	Sex of patient.		Age of patient at time of operation.	Remarks.
		Male.	Female.		
1 and 6	Billroth	1 ...	... 1	23 46	The cachectic symptoms in both cases were very slight indeed.
2	Gussenbauer . . .	1	...	24	In several of the cases

Number corresponding to summary.	Name of surgeon.	Sex of patient.		Age of patient at time of operation.	Remarks.
		Male.	Female.		
	Gussenbauer . . .	...	1	10	the symptoms were slight and incomplete.
	„	1	...	9	
	„	...	1	17	
	„	...	1	34	
9	Studsgaard . . .	...	1	?	"Typical" case, ending fatally after two years.
12	Baumgärtner . . .	...	1	16½	...
	„	...	1	56	...
	„	...	1	23	...
	„	...	1	22	...
	„	...	1	25	...
13	Paul Bruns . . .	1	...	24	...
	„	...	1	26	...
	Sick—Bruns . . .	1	...	10	...
16	Czerny	?	?	?	See Prof. Czerny's letter.
18	Hopmann . . .	...	1	27	...
19	König	1	...	15	...
	„ (see Riedel, 26) .	1	...	20	...
20	Küster	1	...	14	...
22	Mikulicz	1	...	20	...
	„	1	...	34	...
25	Rose—Pauly . . .	1	...	18	...
26	Riedel	1	...	15	Dr. Riedel considers his first case as merely suspicious. It appears to us, however, that it is fully entitled to be looked upon as an example of cachexia strumipriva.
	„	1	...	56	
29--30	Sir Joseph Lister—Gordon	...	1	20	...
35	Sir William Stokes . .	...	1	18	...
40	Bornhaupt—Wolkowitch	...	1	38	...
44	Fritzsche . . .	...	1	31	...
45	Kappeler . . .	1	...	12½	Rather doubtful case.

Number corresponding to summary.	Name of surgeon.	Sex of patient.		Age of patient at time of operation.	Remarks.
		Male.	Female.		
46	Kocher	...	1	11	These statements have been compiled from the short summary at the end of Prof. Kocher's paper in 'Langenbeck's Archiv.' Of nine further cases mentioned in Prof. Kocher's letter [A 46] no details are given with regard to age and sex.
	,,	...	1	23	
	,,	1	...	45	
	,,	1	...	14½	
	,,	...	1	36	
	,,	...	1	12	
	,,	1	...	18	
	,,	1	...	14	
	,,	...	1	26	
	,,	...	1	26	
	,,	1	...	16	
	,,	...	1	12	
	,,	...	1	15	
	,,	...	1	28	
	,,	...	1	16	
	,,	1	...	17	
	,,	...	1	38	
	,,	?	?	?	
	,,	?	?	?	
	,,	?	?	?	
	,,	?	?	?	
	,,	?	?	?	
	,,	?	?	?	
	,,	?	?	?	
	,,	?	?	?	
	,,	?	?	?	
47	Kottmann . . .	1	...	21	...
48	T. L. Reverdin . .	1	...	?	...
	,,	...	1	20	...
	,,	1	...	40	...
	,,	...	1	27	...
	,,	...	1	33	...
50	Roux	...	1	50	...
51	Socin	...	1	26	...
52	Julliard	...	1	66	...
	,,	1	...	17	...
58	Ruggi	?	?	?	...
	,,	?	?	?	...
		24	33	...	

From this table it is seen that in the 57 cases in which the sex could be elicited, the patients were male in 24, and female in 33 cases. There appears to be therefore by no means that preponderance of the female sex which is met with in primary myxœdema.

As to age our table shows that there were:

From 1— 5 years	. . . .	— patients.
„ 5—10 „	. . . .	1 „
„ 10—15 „	. . . .	9 „
„ 15—20 „	. . . .	12 „
„ 20—30 „	. . . .	19 „
„ 30—40 „	. . . .	7 „
„ 40—50 „	. . . .	3 „
„ 50—60 „	. . . .	3 „
„ 60—70 „	. . . .	1 „
		55 patients.

The great majority of the patients afflicted are between ten and thirty years old, which supports Kocher's view that the risk of cachexia developing is greater in individuals whose physical development is not yet entirely terminated. It must, however, not be forgotten that the great majority of operations has certainly been performed in patients between ten and thirty years of age, so that the large preponderance of these two decades in our table ought not exclusively to be attributed to the greater liability of these ages to the disease. Our table shows, at any rate, that no age is actually exempt from it.

Returning now to the main subject of our inquiry, viz. the question of the frequency of cachexia strumipriva in proportion to the total number of those patients who underwent total thyroidectomy on account of benign goitre, who recovered, and whose cases could be followed up further, we find, as stated above, that out of a total of 277 cases, in 22 recurrence of the goitre or hyperplasia of accessory thyroid glands has taken place, that in 186 the patients appear to have remained free from the cachexia without such recurrence or compensating hyperplasia, and that in 69 cachexia strumipriva developed.

The proportion of the cases of cachexia strumipriva to the cases in which the patients remained free, apparently without possessing any acting thyroid tissue, would therefore be 69 in 186, or about 1 in 3.

Considering that if cachexia strumipriva actually depended upon the total loss of active thyroid tissue, this proportion ought not to be 1 in 3, but 1 in 1; the statistical inquiry merely appears to bring out with greater force the general impression which will have been gained by the perusal of the replies of our correspondents, viz. that our investigation directly negatived the hypothesis of such a connection.

But it is just here that we must warn against drawing too definite conclusions from our table. It will have been seen from the first table that marks of interrogation are appended to twenty-three replies in the last column but one of the table, representing not less than 158 out of a total of 186 cases, in which the patients are stated to have remained free from the cachexia after total extirpation without recurrence of the goitre or hyperplasia of accessory thyroid glands.

It will, of course, be understood that these marks are only intended to signify that the replies to which they are appended, do not positively exclude all doubt with regard to each of the five possible sources of error referred to on p. 150, *et seq.* It has been shown how important a *rôle* these sources of error may and do play in the decision of the question at issue, and considering that reasonable doubts with regard to completeness of the reports may be entertained in 118 out of 186 cases, *i. e.* in nearly two thirds of all cases of freedom from the cachexia, it is, to say the least, very doubtful whether the proportion of 1 in 3 can be taken as representing the true frequency of cachexia strumipriva in cases of total extirpation of the thyroid gland.

At the same time it must be admitted that, even if in a good many cases, the original operation may have been unintentionally incomplete, and some degree of recurrence have taken place unknown to the surgeon, or if in numerous other instances an equally unknown compensatory hypertrophy of

accessory thyroid glands should have taken place, or if, in other cases, the cachexia should have developed late, *i. e.* after the patient was no longer under the surgeon's personal supervision, or if, again, in another category, the affection had appeared in so attenuated a form as entirely to escape the patient's own notice, yet it is not easy to believe that these and similar contingencies should have occurred so often as to altogether modify the proportions found by our statistical inquiry. Yet this is the all-important point. Unless it can be shown with tolerable certainty that every case of really total extirpation of the thyroid gland will be followed by operative myxœdema, provided that there are no accessory thyroid glands, the occurrence of the myxœdema cannot be attributed to the loss of the gland itself.

It is evident that our inquiry has not yielded such a result.

Under these circumstances it becomes necessary to investigate whether the myxœdematous symptoms which have followed total thyroidectomy in what is certainly a large proportion of all cases, could be attributed to any other cause than the loss of the function of the gland, and, if so, to which?

The explanation might be, and in part has been, sought for in each of the following hypotheses:

a. Deficient development or atrophy of the trachea, following the operation (Kocher).

b. Injury to the recurrent laryngeal nerves caused during the progress of the operation, or due to inflammation, adhesions, cicatrisation following it (Baumgärtner).

c. Injury to the sympathetic nerve (Baumgärtner).

d. Mode of operation.

e. Endemic influences.

The two first of these hypotheses can be the more readily dismissed from consideration as they have been given up by their own authors. Moreover, the following reasoning will at once show their untenability. If narrowing of the air-passages, which is the supposed ultimate cause common to both of them, were in reality sufficient to produce the symptoms of myxœdema, it is not to be understood why they should not follow as well in other cases of much developed

stenosis of these passages, such as syphilitic contraction of the larynx or trachea, or as bilateral paralysis of the abductors of the vocal cords, and especially why they should not be developed in cases of goitre producing considerable narrowing of the trachea already before the operation. It is, however, hardly necessary to say that under such circumstances as those just mentioned, in which the narrowing is often much more considerable than it could be after the operation, no signs of myxœdema are observed. The two hypotheses, therefore, appear to us inadmissible.

The third hypothesis, on the other hand, commands much more serious consideration. It has been lately propounded by Dr. Baumgärtner, after he had given up his former theory, and sought the explanation of the phenomena in "morbid changes of the centres of the sympathetic nerve, changes which, starting from the wound, affect the sympathetic through the abundant traumatic injuries which have here taken place." He develops this theory at some length in his last paper on the subject ('Deutsche med. Wochenschrift,' No. 50, 1886), and his views deserve the more attention, because Prof. Mikulicz [A 22] also draws attention to the fact that in those of his cases in which later on cachexia strumipriva developed, severe nerve symptoms (tetany) followed almost immediately after operation, and because severe nervous symptoms preceded the development of the cachexia also in Hopmann's [A 13], Sir W. Stokes [A 35], and Wolkowitch's [A 40] cases. Here it ought also to be remembered that Dr. Hadden at one time sought the cause of non-operative myxœdema in disease of the sympathetic nerve. But whilst it will be readily enough admitted, considering the numerous anastomoses of the sympathetic ganglia with the higher nervous centres, and its relations to the organs of the chest and of the abdomen, that deep disturbances of the general health could be thought of as possible consequences of traumatic injuries to the branches of the sympathetic nerve, the weak point of Dr. Baumgärtner's new theory appears to us to lie in the fact that with but exceedingly few exceptions, which we think are much more naturally explained as being probably due to the fact that the remaining part of the

gland was entirely degenerated, myxœdema has not followed much more frequently *partial* extirpation of the thyroid gland.

From our summary B it will be seen that out of more than 550 instances of partial thyroidectomy in which the patients recovered and could be followed up, in 6 only distinct symptoms of myxœdema occurred [Poncet's case, B 9; Hahn's case, B 17; Feurer's case, B 40; Kocher's case, B 44; Reverdin's two cases, B 46]. In other words, while cachexia strumipriva appeared in about 33 per cent. of all cases of total thyroidectomy, it followed partial extirpation of the thyroid gland in little more than 1 per cent. of all cases. This disproportion is so considerable that, in our opinion, it is almost sufficient to disprove Dr. Baumgärtner's theory. For, whilst it will be readily conceded that the traumatic injuries to the sympathetic nerve will be considerably greater in total than in partial thyroidectomy, yet, if the phenomena of cachexia strumipriva were in reality due—as Baumgärtner surmises—to mechanical and chemical injuries and inflammations, which, starting from the field of operation, were transmitted to the neighbouring sympathetic centres and lead to their chemical irritation, hyperæmia, swelling, changes of structure, sclerosis, fatty degeneration and atrophy—it appears to us hardly credible that the disproportion in frequency of the phenomena after total thyroidectomy on the one hand, and partial on the other, should be so enormous as it is in reality. It must be remembered here, too, that many of the operations which we have enumerated in our second summary, are in reality all but total extirpations, very small parts of the gland only having been left intentionally behind. Thus, the traumatic injuries were certainly as great as in cases of actually complete extirpation. Yet so small a percentage of operative myxœdema has followed that it would seem much more natural, as previously stated, to ascribe the occurrence of the symptoms in these cases to the probable atrophy or degeneration of the parts left behind. Again, it must be observed in this connection, that in the only case of cachexia strumiprivra, of which we possess a really full record of the results of the autopsy [Bruns'—Sick's

case, A 13] it is expressly stated: "The sympathetic as wel as the peripheral nerves show normal texture."

And finally the question may be asked here: Why should the cachexia only follow such hypothetical injuries after total extirpation of the thyroid gland, and why not other, equally or even more serious, operations in the neck and in the neighbourhood of the sympathetic nerve. There is no evidence so far as we know to show that a single case has been recorded, in which even the most severe lesions of the sympathetic nerve, caused otherwise than by thyroidectomy, led to the establishment of the characteristic cachexia.

From all this it appears to us to follow that it is, to say the least, very unlikely that injury to the sympathetic system is at the root of the phenomena of cachexia strumipriva.

Concerning the next point, viz. the possibility that the method of the operation may influence its consequences, we can only say that a careful analysis of the different methods of thyroidectomy generally used within the last decade has not resulted in the discovery of a single fact which could give a clue concerning this question. Cachexia strumipriva has followed after very different methods of thyroidectomy, and the charge can certainly not be brought forward against that method after which it has followed most frequently, viz. Kocher's, that it was more injurious to the nerves and vessels of the neighbourhood than any other.

The last point we have to consider here is the possibility of endemic influences. We have already previously said that it is certainly a very remarkable fact that the cachexia should have followed so often the operation in the experience of a few surgeons, and not at all, or very rarely, in that of others. The idea which we find expressed by several surgeons [*e. g.* Dr. Kottmann, A 47; Prof. Bottini, A 54; and Rotter, see p. 135), viz. that the occurrence of cachexia strumipriva after operation depends upon the endemic character of goitre in the locality in which it is practised, and that it takes place *in spite* of the extirpation of the goitre, which merely represented an accompanying symptom of a progressive cretinoid affection, cannot be entirely disregarded.

But quite apart from the fact that if this view were correct one would naturally expect a much greater frequency of the symptoms of myxœdema in goitrous patients who have never been operated upon at all,* it is sufficient to say, enlarging Prof. Reverdin's arguments,† that the facts have charged themselves with the demonstration that cachexia strumipriva has developed at Prague, at Copenhagen, at Heidelberg, at Cologne, at Göttingen, at Berlin, at Warsaw, at Posen, at Aix-la-Chapelle, at Edinburgh, at Dublin, at Bologna, as well as at Berne, at Baden-Baden, at Tubingen, at Geneva, or at Kiew, and that, moreover, Prof. Horsley's monkeys were there to show that it is not necessary to inhabit a country of cretins in order to become myxœdematous after thyroidectomy.

In the face of these facts this hypothesis appears to us quite untenable.

Other hypotheses mentioned by Bourneville and Bricon in their excellent paper, such as that the cachexia was due to an alteration of the pituitary body and the pineal gland, or to the action of the carbolic acid during the operation, &c., do not appear to demand a detailed refutation.

Thus this part of our inquiry has not yielded any definitive results. The occurrence of cachexia strumipriva, which in its manifestations is absolutely identical with those of primary myxœdema, in fully one third of all cases of total thyroidectomy, establishes under all circumstances an undeniable connection between these phenomena and the operation, but our material has not enabled us to come to the certain conclusion that the phenomena of cachexia strumipriva are due to the loss of function of the thyroid gland. On the other hand,

* It will have been observed that of all our correspondents only Prof. Czerny [A 16] speaks of having observed decided signs of myxœdema in goitrous patients. The rarity of this occurrence would be naturally explained, it seems to us, if it were assumed, as is very likely indeed, that but in exceptional circumstances the *degeneration* of the gland becomes so complete as to be in its effects equivalent to its total ablation.

† 'Revue médicale de la Suisse romande,' 1887, reprint, p. 10.

no other hypothesis of which we know gives a more satisfactory and tenable explanation of these phenomena. It may be hoped that at a future time, from a renewed inquiry, based upon a material all details of which are unassailable, more definite conclusions may be drawn which, perhaps, will fully establish what appears to us—especially in consideration of Prof. Horsley's and Dr. Fuhr's physiological experiments—to be the most natural explanation, viz. that both primary and operative myxœdema depend upon the loss of the functions of the thyroid gland, although even then the inquiry would have to go further, and to ask by what influence this loss is caused in cases of genuine myxœdema. But at present we have not arrived yet even at this stage, and, in reply to the question: "What is the cause of cachexia strumipriva?" we must confess that we have to wait.

FELIX SEMON.

P.S.—After the M.S. of the foregoing part of our report was already in the hands of the printer, Prof. Bruns kindly forwarded to us his latest contribution to the question under consideration. His paper is entitled "Zur Frage der Entkropfungs-Cachexie," and is published in the "Mittheilungen aus der Chirurgischen Klinik zu Tübingen," vol. iii, Heft 2, Tübingen, 1887, bei H. Laupp. In this important paper, Prof. Bruns come to the definite conclusion that the cachexia observed after thyroidectomy is solely due to the loss of the specific function of the thyroid gland, which function probably consists in materially aiding metabolic processes, and which is indispensable to the normal activity of the central nervous system. In developing this view, Prof. Bruns travels over the greater part of the field covered by our own report, and in many respects his arguments are almost identical with our own. If, nevertheless, the ultimate conclusions differ to some extent, this difference is simply due to the fact that Prof. Bruns expressly states that his paper is mainly intended to represent his personal experiences, whilst we have had to base our conclusions upon the widely different experiences of all our correspondents.

We greatly regret that Prof. Bruns' communication came to hand only at a time when it would have been impossible to utilise its details without greatly disturbing the printing of our own report, which, in consideration of the limited time at our disposal was not deemed expedient.

For the same reason we have been unfortunately unable to avail ourselves of the papers of Dr. D. G. Zesas's "Fünfzig Kropfoperationen" ('Langenbeck's Archiv,' vol. xxxvi, Heft 3), and of Dr. Albert Hoffa's "Ueber die Folgen der Kropfexstirpationen" ('Verhandlungen der physikalisch-medicinischen Gesellschaft zu Würzburg,' xxi, No. 3, 1887), in both of which several more cases of cachexia strumipriva are communicated.—F.S.

DESCRIPTION OF PLATE X.

A Case of Cachexia Strumipriva under the care of Prof. Baumgärtner (see p. 103).

Fig. 1.—Shows aspect of patient before operation.

Fig. 2.—Shows appearance eighteen months after total removal of the goitrous thyroid gland.

Fig.1.

Fig.2.

From Photographs

Danielsson & Co. lith

GENERAL SUMMARY.

Considering, in the first place, the collection of symptoms to which the term Myxœdema has been applied, the Committee have to state that they believe myxœdema to be a distinctly marked and defined disease; that, in the accepted phrase of the day, they regard it as a "clinical entity." The general uniformity of the more prominent symptoms is, indeed, remarkable, allowing of ready recognition of the malady in any freshly encountered case by an observer who has seen one well pronounced case. For, as cretins resemble one another so that they might be taken to be members of one family, so also do the subjects of myxœdema, most approximately in physiognomy, character of voice, and mode of speech. These points are in part indicated by the analysis of symptoms, but are even more strongly suggested by the personal observations of the Committee and others, although such observations are more capable of general statement than of numerical record.

Symptoms.—The elaborate table of analysis of symptoms which forms the basis of the clinical part of this report, shows clearly that a considerable number of cases presenting what may be called the type-signs, as described by Sir William Gull and Dr. Ord, have been observed, and that a large number of minor or accessory signs noted by those observers have been associated with them.

Under the head of type-signs the following may be enumerated: the marked increase in the general bulk of

the body; the firm swelling of the skin, not pitting on pressure, inelastic, adherent to the parts beneath, and not affected by gravitation; the dryness and roughness of the skin, tending, with the swelling, to obliterate all lines of expression; the imperfect nutrition of the hairs, leading to their loss; the local tumefaction of the skin and subcutaneous tissue noticed in various parts of the body, but most frequently in the supra-clavicular regions; the turgescence and infiltration of mucous membranes, leading, in the mouth, to an affection of the teeth homologous with that of the hairs just mentioned; the remarkable physiognomy; the slow, painful utterance, monotonous voice, and leathery quality of tone thereof, with curious nasal explosion at short intervals during speaking; the slowness of thought and movement; the slowness of perception and response; the defect of memory; the frequent occurrence of mental disorders of an irritable and suspicious character, or of hebetude and somnolence alternating with excitability; the tendency to fall, owing to disorder of co-ördination; the existence of subnormal temperature of the body; the aggravation of all symptoms during low climatic temperatures; and the diminution or apparent absence of the thyroid gland. Among the minor or accessory signs, may be quoted abnormal subjective sensations, belonging particularly to taste and smell; occipital headache; marked alterations of temper; and a curious persistence of thought and action, overriding all attempts at interruption by friends or observers.

But the larger table adds much and most interesting information to the earlier observations, chiefly in respect of the accessory symptoms, and of possible causal relations. The wider experience allows of some primary classification of the altered mental states. It shows that delusions and hallucinations occurred in nearly half the cases recorded, mainly when the disease was advanced; that insanity was noted in about the same proportion; that it took the form of acute or chronic mania, dementia, or melancholia, with a marked predominance of suspicion and self accusation. It will presently be seen in Mr. Horsley's report that tremors and contractures

have occurred in monkeys after extirpation of the thyroid body. Tremors and contracture affecting both hands and feet have been noticed as late phenomena in one case which has been for twelve years under observation, and also in others.

As regards the skin, the tables bring out the frequent occurrence of moles and warts, certainly not remarked in the first cases. The distribution of the swelling of the skin in the early stages of the disease appears to be far from uniform. In many cases, instead of being general, it is localised, the head and face being most frequently first affected, next the lower extremities; lastly the upper extremities.

Hæmorrhages. — The state of the tissues in myxœdema would at first sight make it probable that, in the event of pregnancy, a far from uncommon occurrence, hæmorrhage would occur after delivery. In the first case observed by Dr. Ord, as far back as 1864, severe hæmorrhage occurred in three successive parturitions. But the clinical record indicates a much more general tendency to hæmorrhages. Severe bleedings from nose, gums, teeth, and bowels have been noted. Recently a case has come under observation in which dangerous hæmorrhage came from an exposed tooth pulp. And, when the history of more recent cases has been carefully investigated by the light of the information accumulated, hæmorrhages appear to be much more common than was at first suspected.

History and antecedents.—In respect of the previous history and antecedents of the persons affected by the disease, it is obvious that an extended record would offer much information in amplification and correction of the necessarily restricted information afforded by the small number of cases whereon the first identification was founded. At first it appeared probable that the disease affected women only, and women again in middle life. It appears now that men are affected, though in much smaller proportion than women, namely, one man to six women, and that the disease may start in early adolescence, or be delayed to old age. The probable identity of myxœdema

with the so-called sporadic cretinism observed in children will be considered later on.

Causation.—The most careful consideration of the information bearing on the causation of myxœdema affords nothing of a decisive character. The patients come from all grades of society, and from no particular localities. It is true that a considerable number, viz. eleven cases, are reported from Lower Brittany; and it is worthy of remark that those districts of England in which goitre and sporadic cretinism most frequently present themselves do not, so far as appears, contribute any excess of cases of myxœdema.

Heredity certainly appears to play some part. There is evidence to show that the disease may affect several members of one family, and there is evidence also of transmission from father and mother to children, chiefly on the female side. But behind heredity lies still the question of ultimate causation. It appears probable that neither syphilis nor alcohol are factors in the production of the disease. Tubercle is recorded in sufficient proportion to justify its recognition as a well-marked associate, if not a predisposing cause. Mental disturbance and neuroses have been shown to occupy a large part of the portraiture of the disease. They are also occasionally recorded as predecessors of the actual symptoms; but it is, at present, impossible to say whether, on the one hand, they are to be considered causes, or to be, on the other, relegated to the position of early symptoms. In a few cases the appearance of the symptoms of myxœdema has been preceded by exophthalmic goitre, the evidence on this point appearing to be pretty clear. Subsequently, a great reduction of the thyroid body to a bulk below normal has been noted concurrently with the development of the signs of myxœdema. So far most of the observations on myxœdema have been made on well-pronounced cases of some years' duration. As experience grows, there will arise the possibility of recognising cases in early periods, and of determining the existence, at such periods, of changes in the thyroid body. It is not too much to say that in this aspect all cases of exophthalmic goitre ought be followed with much care.

The fact that myxœdema has been observed much more frequently in women than in men, suggests, *primâ facie*, that we may find some helpful indication from investigation of the state of the sexual organs. In the broadest view no such help is afforded. The disease affects unmarried and married women. There is no obvious influence of catamenial disturbances. Pregnancy occurs, and runs its normal course, recurring in fact after the establishment of the disease. The above broad statement does not, however, preclude the possibility that myxœdema may, in part, depend upon uterine disturbance. It is known that alterations in the vascularity of the thyroid are observed in connection with both menstruation and pregnancy; but in the male we have little information concerning the functional activity of the gland in relation to physiological processes elsewhere. It is possible that the more frequent occurrence of myxœdema in the female sex may depend on the fact that the thyroid gland being functionally more active than in the male, is thereby more apt to be attacked by destructive degenerative changes.

One case has certainly presented a remarkable variation of myxœdema in connection with pregnancy. The patient, after presenting the full physiognomy of myxœdema, became pregnant, whereupon all the swelling passed away, to return after the birth of a child. This succession of phenomena occurred three times during seven years. The observation bears upon a point of some interest, and, as regards pathological anatomy, some importance. The swelling of myxœdema turns out to be a fluctuating condition in many cases. It varies under differences of temperature, being greater in cold weather, less in warm. It appears to vary under treatment, and very often it diminishes as the patient approaches the end of the term of life. Then, often the skin, previously plump and distended, falls into wrinkles and coarse inelastic folds, is no longer adherent to the parts beneath, but nevertheless has recovered none of the characters of health. The great majority of cases of myxœdema hitherto reported have reached, when first recognised, a well-advanced stage. We may hope that in the near future the disease may be detected

in its beginnings, and to have the matter of variations carefully studied, both as regards the frequency of this occurrence and the conditions accompanying the presence or subsidence of the general swelling.

Modes of dying.—Death usually results from intercurrent maladies, chiefly pulmonary ; but occasionally it would appear to be directly dependent on the disease itself, the patients succumbing to exhaustion, general or nervous.

Treatment.—In many cases of myxœdema, periods of improvement have been observed, and in one instance an actual recovery is alleged to have taken place. The conditions under which these favorable remissions occur in the natural course of the disease are very imperfectly understood, and it is probable that more extended knowledge in this respect will lead to a very material advance in the treatment of the disease. There is no doubt, however, that the maintenance of warmth in the surrounding atmosphere has a marked beneficial influence, and this suggests the importance of studying climatic conditions in the treatment of myxœdema. It has been found practically that the regular removal of patients during the winter to southern climates has caused amelioration in the symptoms. Professor Horsley is led to observe, from his experiments, that "exposure to cold determines an earlier appearance of the symptoms, warmth delaying the same" (p. 80).

As regards drugs, there is no doubt that jaborandi and pilocarpin exert a beneficial influence in myxœdema, mainly, it would appear, from their action on the skin.

Nitro-glycerine deserves a more extended trial, as it seems to have proved of decided service in a few recorded cases.

The use of tonics, particularly of iron, quinine, and the hypophosphites, has been adopted with a certain amount of temporary success.

Pathology.—The pathology of myxœdema has been studied by a sub-Committee. This report has to be considered in two aspects. First, as regards evidence bearing on the causation of the disease. Second, as regards concomitant tissue-changes. Under the first head the conclusion of the sub-Committee is

that myxœdema is dependent on a destructive affection of the thyroid gland. The basis of this conclusion is set forth in detail by the sub-Committee. The thyroid gland appears to be generally diminished in size, to have lost its dull reddish tint, and to have become yellowish or pale. In its structure a delicate fibrous tissue has invaded and replaced the proper glandular tissue. To use the words of the report, "The morbid condition seems to begin as a small-celled infiltration of the walls of the vesicles, and this is accompanied or soon followed by epithelial proliferation in the vesicles themselves. In a more advanced stage the gland becomes converted into a delicate fibrous tissue in which clumps of small round cells, clearly the remains of the vesicles, are scattered. In the last stage, the gland structure is replaced by fibrous tissue in which small islets of round cells are sparsely placed" (p. 44).

It is obvious that the results of post-mortem observation regarding the state of the thyroid gland are much more decisive than observations made during life. The thickened state of the skin and subcutaneous tissues in the neck involves difficulty in determining the size of the thyroid gland. Nevertheless, the whole series of observations tend to the belief that in myxœdema the gland, with rare exceptions, is diminished in size.

The accessory conditions have next to be considered. The report of the sub-Committee deals in an important way with the changes manifested in the skin. "As regards the skin we have found very frequently the nuclear hyperplasia and the development of connective tissue which Dr. Ord describes in his original paper, and these changes occur mainly in the neighbourhood of the sudoriparous and sebaceous glands, and around the hair-follicles. In a few instances the sub-Committee has noticed an unusual interval between the bundles of fibrous tissue in the corium. This open-textured condition is, however, quite exceptional, and it differs in no respect from what is seen in ordinary œdema" (p. 45).

(*Note by* Dr. Ord.—I venture to observe in relation to this paragraph that the appearances thus regarded as in no respect different from what is seen in ordinary œdema, were,

as far as sections of my own cases are concerned, derived from skin which did not present during life or after death the conditions of ordinary œdema. During life the skin was tough and resistant, and after death remained firm on section without exudation of fluid from the cut surfaces. It appears to me important to bear in mind the importance of interpreting the microscopic appearances, at least in part, by the light of the macroscopic appearances. I contend that the conjunction of the two indicates that whatever material filled the unusual interval between the bundles of fibrous tissue, was at least something different from serous fluid, and had something of a gelatinous consistence.)

The loss of hair, the absence or diminution of perspiration and of the secretion of the sebaceous glands, are ascribed by the sub-Committee to the anatomical lesions which are so often seen in the skin. In passing, it may be noted that the decay and falling out of the teeth bear similar relations to changes in the mucous membrane of the mouth. The increase of bulk of the body commonly observed in myxœdema is attributed by the sub-Committee to an overgrowth of the subcutaneous fat. The overgrowth of interstitial fibrous tissue, which Dr. Ord has recorded in his earlier cases, does not appear to have been found with anything like corresponding frequency in the sections of other cases subsequently examined by the sub-Committee. They are, in fact, regarded by the sub-Committee as being, to a large extent, such interstitial changes as might be expected in a certain proportion of persons dying in adult or advanced life. As regards the nature of these less constant interstitial changes, and of the more constant changes in the skin, the sub-Committee express the opinion that they resemble the inflammatory process. This view has been also clearly stated by Professor Virchow, who has also expressed an opinion agreeing with the final conclusion of the sub-Committee, namely, "that interstitial change does not occur in the organs as a generalised condition, though it occasionally is present to a varying degree in the sympathetic, the kidneys, the liver, the heart, and the submaxillary gland" (p. 46).

The sub-Committee does not recognise the existence of any important changes in the central organs of the nervous system, nor in any important proportion in the sympathetic. In final overview of the extremely careful investigations of the sub-Committee, it will be seen that they definitely recognise a destruction of the thyroid gland, in which its proper elements are replaced by a delicate fibrous tissue, as at least a constant condition in myxœdema, and presumably its direct cause; that no explanation of the origin of this condition is at present apparent; that the interstitial changes commonly observed in the skin and with far less constancy in the viscera, appear to be of an irritative or inflammatory nature.

Chemical analysis of human tissues.—In sequence of the Report of the Pathological sub-Committee, Dr. Halliburton's report on the chemistry of myxœdema must, as respects its first portion, be next considered. It will be remembered that, in Dr. Ord's first fully recorded case (H. J—), Dr. Cranstoun Charles, examining a large mass of skin, and comparing it with similar quantities of skin obtained from the bodies of persons not affected with myxœdema, had found a very large excess of mucin in the skin of the myxœdematous patient. Dr. Halliburton has made an extensive series of observations on the percentage of mucin present in the skin and also in connective tissue, in tendons, in heart-tendons, and elsewhere. He also quotes the results of observations by Dr. Stevenson and Dr. Bernays. The results obtained by all three observers are in complete agreement one with the other.

The outcome of these observations is that the increase of mucin, as found by Dr. Charles in Dr. Ord's first case, has not been found in anything like so great an amount in subsequent cases. It is to be observed that Dr. Ord's first case presented, at the time of death, the full swelling of myxœdema. As Dr. Halliburton remarks, with regard to his observations, the non-existence of the increase of mucin is in certain cases accounted for by the fact that the patients have not died while in the typical swollen stage, but in the subsequent atrophic period of the disease; again, in other cases, the subcutaneous connective tissue has become replaced by

fat; and in other cases still, the analyses are to a great extent vitiated by the keeping of the specimens for long periods under alcohol before analysis. Dr. Halliburton points out that the source of mucin in the body is twofold. His remarks on this point are so full of suggestion that we transcribe them *in extenso.*

1. "It results from the degeneration of the protoplasm of epithelium cells, as in the goblet cells of mucous membranes, and the cells of the acini of mucous glands like the submaxillary. In the myxœdema of human beings this source of mucin has not been to any great extent investigated. The most important analysis bearing on this point is the one analysis of the parotid gland which has been made, and which showed a distinct increase of mucin. This is interesting in connection with Prof. Horsley's experiments on monkeys, in which it was shown that in the myxœdema artificially produced in them, the cells of the parotid, which normally secrete clear saliva, secrete a viscid saliva; by the microscope the cells were found swollen by mucinogen, and by chemical analysis mucin was found to be greatly increased in amount.

2. "It forms a constituent part of the ground substance or stroma of connective tissue in which the cells and fibres are embedded. This substance is chemically a muco-albuminous material. One of its constituents is mucin, the other a proteid of the globulin class, which in its reactions resembles the serum globulin or paraglobulin of the blood. In the chemical investigation of myxœdematous tissues only one of these constituents, viz. the mucin, has been estimated. It would make the investigation more complete in future analyses if the globulin were also estimated and the amount present compared with that in normal tissues. In new and loose connective tissue the ground substance is present in greater amount than when the fibrous (collagenous) material replaces it in a later stage. This is illustrated by the fact already noted of the higher percentage of mucin in the skin of infants as compared with that of adults. In myxœdema it seems that the swelling is at a certain stage due to the increase of this ground

substance, and hence the increased percentage of mucin, but at later stages, when white fibres or fat cells have permeated it, the increase of mucin is not so marked" (pp. 55, 56).

The second portion of Dr. Halliburton's observations being made on animals subjected to experiment will be more appropriately considered after Professor Victor Horsley's statement of the results of the ablation of the thyroid gland in animals has been studied.

Experimental researches on the thyroid gland.—Professor Victor Horsley, F.R.S., has undertaken the investigation of the results of the removal of the thyroid gland in animals, and has placed his observations at the service of the Committee. Professor Horsley's report includes, in addition to the results of his experiments, a very large consideration of the function and pathology of the gland. In an historical sketch he mentions the fact that the first experimental investigation of the functions of the thyroid gland was made in England by Sir Astley Cooper. The rest of the sketch presents a record of various observations, some indecisive, some conflicting, leading up to the institution of his own experiments. In particular, he draws attention to the observations of Munk, who, admitting that extirpation of the gland had been frequently followed by stupor, convulsions, and coma, thought the results which he had obtained were due, not to loss of the thyroid gland, but to certain injuries inflicted on surrounding parts. In the second section of his report, Professor Horsley lays down, as a first condition of experiment, the necessity of obtaining asepsis of the wound. In the next place he asserts that it is easy, in operating for the removal of the thyroid, to avoid injury of surrounding parts, notably of the nerves behind the gland, the sympathetic, vagus, and recurrent laryngeal. Thirdly, he denies the occurrence of injury of the trachea, which has been regarded by Kocher and Lombard as giving rise to cachexia strumipriva, through the production of conditions leading to chronic asphyxia. Fourthly, he notes the importance of the presence or absence of accessory thyroid glands in cases where animals have survived the operation of excision.

In his third section (Details of Researches) Professor

Horsley remarks that all observers, from Huschke downwards, agree in admitting the importance of the gland to the new-born and rapidly growing animal, and its degeneration and atrophy in approaching senility, which condition, he observes, closely corresponds in many particulars to the myxœdematous state. He regards the variation of the gland, in connection with certain states of physiological activity, as not at present accurately known. He next examines in detail the results of extirpation of the thyroid, made in various animals by various observers. From his statement it appears that while as regards rodents a number of observations have been made on rats and rabbits, with uniformly negative results, the removal of the gland in carnivora has almost invariably been followed by death, preceded by symptoms of myxœdematous cachexia. It appears that in dogs 95 per cent. succumb, after supposed complete extirpation, within a period varying from a few days to rarely as long as two or three months. The symptoms following the removal of the gland are first dulness and apathy, next fibrillar twitchings in the muscles, going on to violent clonic convulsions affecting all the extremities and the trunk. These spasms are accompanied by violent dyspnœa, and often by a half comatose state, passing finally into complete unconsciousness. Coupled with spasm, and marching with it, paresis, mostly affecting the voluntary muscles of the limbs, is noted, and various disturbances of nutrition occur. The temperature gradually falls, after a preliminary rise, and becomes sub-normal before death. In the blood the red corpuscles diminish in number, the leucocytes increase. In the fourth section, compensatory hypertrophy of parts left behind is considered, but no decisive conclusions are drawn. In the seventh section, headed "Further Relations of the Thyroid Gland with other Processes in the Body notably Hæmatopoiesis," Professor Horsley, after discussing the anæmia following the removal of the whole gland in cats and dogs, relates an experiment which has certainly an important bearing on the clinical as well as the pathological aspect of myxœdema. The observation is of such importance that it is quoted at length.

"No. 2 sheep. Result: Died of *acute myxœdema*, brought on by accidental exposure to cold $1\frac{2}{3}$ years after extirpation.

"The fatal case in the second sheep is one of much interest, since it entirely negatives the view that the effects of total extirpation are due to injury of neighbouring structures in the course of the operation, and proves that the myxœdematous state is produced by the loss of the thyroid. It is worth while, therefore, to mention the leading features in this instance. The thyroid was removed (October 3rd, 1885), with the usual precautions, and primary union of the wound resulted. The sheep emaciated and was weak a fortnight later, but its temperature was normal and appetite good. No marked change was observable in the animal except that it gradually recovered its general nutrition, and apparently became more stupid even than before the operation. In the meanwhile the wool grew, and not being cut covered the animal very thickly. In view of the approaching summer weather it was shorn in the first week of May, 1887. The weather, which had been mild, became very cold; the animal was then observed to become ill, it lost its appetite, then exhibited the usual symptoms of the acute cachexia, viz. the spasms, paralysis, coma, anæsthesia, tetanoid contracture, and fall of temperature to 25° C. It died on May 20th, 1887, *i. e.* 569 days after the operation. The post-mortem examination showed 'gelatinous' infiltration of all the subcutaneous tissue, which under the microscope (see Pl. IX) was evidently mucinous degeneration of the ground substance, and by chemical analysis (*vide* 'Chemical Report,' p. 60, by Dr. Halliburton) was shown to be actually mucin. The thyroid gland had been completely removed" (pp. 76, 77).

It is impossible to mistake the value of this observation in regard to the fluctuations of the human subjects of myxœdema. In them the influence of surrounding temperature is always apparent. They fail in all ways during cold weather; they improve in warm weather; and, in proportion as the adverse influence of cold climate can be withdrawn or opposed, they improve in health, or cease to decline. An experiment made

by Professor Horsley on a donkey lends strong support to the foregoing observation.

We come now to the most decisive of Professor Horsley's experiments, viz. those in which he removed the thyroid gland from monkeys. The general course of the symptoms which follow complete extirpation of the thyroid in monkeys, is related by Professor Horsley under two headings: 1st, acute myxœdema, 2nd, chronic myxœdema or cretinism.

The symptoms of acute myxœdema, by which Professor Horsley designates cases in which the symptoms following extirpation of the thyroid run a rapid and continuous course terminating in death, are stated to appear within a few days after the operation. The interval has varied from the second to the twelfth day, being shorter in younger animals than in older; while in proportion as the symptoms appear later, the length of the subsequent illness is extended; in other words, death is further postponed. Exposure to cold determines an earlier appearance of the symptoms, warmth delaying the same. Professor Horsley states as follows the phenomena of acute myxœdema: "*Motion*, tremor, clonic spasm (paroxysmal), contracture, paresis, paralysis. *Sensation*, paræsthesia, then anæsthesia. *Reflexes* gradually diminished. *Mental operations*, normal at first, are soon diminished in activity, and then follow apathy, lethargy, coma" (p. 81). With these come fall of temperature to subnormal degree, after an initial rise, anæmia, leucocytosis, and fall of blood-pressure; failure of nutrition with mucinous degeneration of the connective tissues, increase of mucous secretion, usually atrophy and falling out of the hair, and sometimes enlargement of the spleen. Professor Horsley draws attention to the remarkable correspondence of many of these symptoms with those of idiopathic myxœdema, of cachexia strumipriva, and of exophthalmic goitre.

First, in respect of the tremors in the early stage. Similar tremors certainly occur in the three conditions above mentioned; and it is of great interest to note that, in several recently observed cases of myxœdema, tremors and contractures have been observed, not only where the disease was commencing, but in cases of many years' duration. These

phenomena, indicating dissolution of nervous energy, appear indeed to be much more common in myxœdema than was indicated by the earlier observations, and are among the things which are to be carefully looked for in the future.

Other correspondences consist in the lowering of temperature, in the anæmia, and perhaps leucocytosis, and the excessive mucinous secretion. Moreover, Professor Horsley states that "the monkey shows the appearances which are characteristic of the disease known as (idiopathic) myxœdema; the eyelids become puffy with elastic œdema, the features grow heavy and coarse, the skin being rough in some cases and the hair falling out. At the same time the urine is normal, *i. e.* non-albuminous, &c." (p. 82).

It is hardly necessary to indicate the parallel between these changes and the more salient appearances of myxœdema. The state to which Professor Horsley applies the term "chronic experimental myxœdema or cretinism" appears to be determined by the influence of temperature. When monkeys, from whom the thyroid gland had been completely removed, were kept comparatively warm, in air at a temperature averaging 90° Fahr., acute myxœdema was averted; and the average duration of life, in five cases, was extended to 125 days instead of twenty-four. The character of the prominent symptoms was also remarkedly changed. Mucinous degeneration was replaced by marasmus, and mental disturbance became the most prominent feature among the special symptoms. The animals in all the cases resemble cretins in every particular. "It seemed as if the animal had been enabled to pass through (1) a neurotic and (2) myxœdematous stage into (3) a marasmic and cretinic one" (p. 85)

As regards the post-mortem examination of these animals Professor Horsley makes a statement which has an important bearing upon the variation of conditions which constitute so great a difficulty in the morbid anatomy of myxœdema. "Post-mortem examination of these animals fail to show the mucinous degeneration noted in acute experimental myxœdema, but on the other hand revealed rather fibroid or cirrhotic changes in the tissues.

"Chemical examination, moreover, revealed the same fact. Allusion may be made here to the similar character of the course of the tissue changes in those cases of idiopathic myxœdema and cachexia strumipriva, where life is so prolonged that the disease passes fully into the cretinic stage" (p. 85).

Finally, we present Professor Horsley's summary and conclusion.

"Comparison of the foregoing facts with the clinical observation of the forms in which the myxœdematous cachexia presents itself in man, leads us to conclude that the loss of the thyroid gland is the determining factor in the production of the array of symptoms described in the Clinical Report. For the sudden ablation of the thyroid from a normal animal evidently produces in it the myxœdematous cachexia, this varying in intensity according to the importance of the gland to the particular animal the subject of the experiment. If we may form from this evidence a scheme of the pathology of idiopathic myxœdema and cretinism it would result that some as yet unknown condition (possibly of the central nervous system) causes atrophy of the thyroid gland, and consequent upon this are developed the symptoms of cachexia known in its various forms as myxœdema, cretinism, and cachexia strumipriva" (pp. 86, 87).

Chemical analysis of the tissues of animals.—The second part of Dr. Halliburton's report may now be quoted in relation to Professor Horsley's investigations. It appears from this report that in acute experimental myxœdema, as observed in monkeys, Dr. Halliburton has found a remarkable increase in the percentage of mucin in the skin, in tendon, in the salivary glands, and in the blood. "The presence of mucin in large amount in the parotid, which normally contains none, is specially noteworthy. This chemical result was confirmed by microscopical examination, the cells of the acini being swollen with mucin, and simulating those of a mucous gland like the submaxillary" (p. 56).

In the blood mucin appears to be present in increasing amount, more or less proportionate to the increasing development of the myxœdematous condition of the animal. In the

more chronic form of experimental myxœdema in monkeys, determined, as may be remembered, by the maintenance of a high surrounding temperature, excess of mucin in the various parts mentioned is not observed. Two observations on other animals than monkeys cannot pass without notice. First, the blood of a donkey from which the thyroid had been removed was examined 205 days after the operation. No mucin was found in it. Second, "the blood of a sheep from which the thyroid had been removed was examined twenty-seven days after the operation. No mucin was found in it. . . . . The animal was killed nearly two years afterwards, it having developed myxœdematous symptoms when it was shorn and exposed to cold. It showed no signs of myxœdema before this. The blood, pericardial and cerebro-spinal fluids then contained no mucin. The peritoneal fluid contained a doubtful trace. The urine contained abundance of mucin. The 'gelatinous' and fatty connective tissue from the anterior triangle of the neck contained ·09 per cent. of mucin. Although there are no analyses in healthy sheep to compare with this result, it seems to denote a considerable increase in the amount of mucin present, normal adipose tissue in other animals yielding only imponderable traces. The sterno-mastoid muscle and lymphatic glands were also examined from the same animal, and found to contain a trace of mucin" (pp. 59, 60).

There is much in this report of great physiological interest and strongly demonstrative of the skill and sincerity of the observer. The report cannot fail to be an important guide in further investigations, not only on the chemical aspect of myxœdema, but upon the physiological chemistry both of the thyroid gland and of the mucous glands.

Results of total and partial extirpation of the goitrous thyroid gland in man.—This last report is presented by Dr. Felix Semon, but that it should be taken last is somewhat a case of *πρότερον ὕστερον*. Seeing that the appointment of this Committee was determined by the fact that Dr. Semon had drawn the attention of the Clinical Society to a paper published in 1883 by Professor Dr. Theodor Kocher, of Berne, on "Thyroidectomy and its Sequelæ," it would have

seemed proper to have taken this report earlier. But it will be readily seen, that while this report goes very deeply towards the root of the causation of myxœdema, its importance is best estimated after a full survey of the remaining evidence. Professor Kocher's paper, written apparently without knowledge of the description of myxœdema already published in this country, painted most graphically the picture of the disease as occurring in an entirely different aspect, viz. as the result of the extirpation of the goitrous thyroid gland.

It is not necessary to discuss the singular correspondence of details. This fact is already generally appreciated. At the request of the Committee, Dr. Semon put himself in communication with medical men in all countries who were reported to have performed excision of the thyroid gland, with a view to obtaining information as to the sequence of symptoms in any way resembling those of myxœdema, on the operation.

The results of the inquiry are set forth by Dr. Semon in a full and singularly impartial paper. It appears that, in reply to 115 circulars sent out, altogether 69 communications have been received, of which number 6 were sent by Austrian, 2 by Belgian, 16 by British, 2 by Danish, 1 by a Dutch, 2 by French, 20 by German, 1 by an Italian, 3 by Russian, 3 by Swedish and Norwegian, and 13 by Swiss surgeons. For various reasons, not more than 64 of such replies could be utilised, and these only in various degrees. In the analysis of the information thus afforded, an important classification is first made. Some operators have adopted the principle of entire extirpation, others have been satisfied with less complete removal, and, even in the case of intended complete removal, the possibility of the existence of accessory thyroid glands has to be remembered. The first class of cases investigated is that in which total extirpation has been made. The evidence as to the occurrence of anything like myxœdema after the operation is very various and very conflicting. While, for instance, Professor Kocher, operating on 32 cases, and Professor Reverdin, of Geneva, operating on eighteen, have found the symptoms of myxœdema

subsequently appearing in a very large proportion of the subjects, the experience of Professor Billroth, of Vienna, and of Professor Bardeleben, of Berlin, is of an entirely different character. Among 146 total extirpations, performed in Professor Billroth's clinique, myxœdematous symptoms were observed only in two. Professor Bardeleben states, that in not one of the 15 total extirpations performed by him since 1876, symptoms of cachexia strumipriva have followed. Between these extremes many gradations are noticed. In the consideration of the whole group of reports, it is obvious that the evidence as to the sequence of myxœdema upon extirpation of the thyroid gland could not be unanimous, or, on the record, conclusive.

In the first place, as the replies show, many patients die shortly after operation; in the second place, many patients pass out of observation, or are not observed for a sufficient length of time. In the third place, the probability of the sequence has not presented itself in an equal degree to all observers. In the fourth place, it is not by any means certain that, even where the main thyroid gland has been entirely removed, accessory thyroid glands have not been in existence; and it may be observed that recurrence of the tumour, frequently noted, may mean either that the operation was incomplete, or that supplementary thyroid existed.

As regards partial operations, the results are, as might have been expected, less conclusive.

Dr. Semon, reviewing the whole series of results submitted to him, draws the following inference:

"That there is an affection, following, in a certain number of cases, total, and, in a much smaller proportion, partial extirpation of the goitrous thyroid gland in man, which is clinically identical with primary myxœdema. As in the primary disease, the symptoms are not always equally well developed in the operative variety, and in this respect important differences appear to obtain between the cases of total and those of partial extirpation of the goitrous gland. The only real addition, however, to the symptoms of the primary malady, which sometimes occurs in the operative variety,

when the operation has been performed on children, viz. the stunting of the growth of the body, finds its natural explanation in the fact that primary myxœdema almost always attacks persons in whom the period of evolution of the body has been completed.

"Another apparent difference between the two varieties, viz. the tendency to improvement or even to complete disappearance of the cachexia in a certain number of cases of operative myxœdema, seems to be due, *so far as we can conclude from the few hitherto carefully observed cases,* to the fact, that in these cases the operation was either not total after all, or that accessory thyroids existed, and that in either case a late hypertrophy of the remnants of thyroid tissue with resumption of the function of the thyroid occurred.

"Of the pathological identity or otherwise of the two varieties, however, it is impossible to speak as yet with any certainty, because the number of post-mortem examinations made in cases of operative myxœdema is very small, viz. 8 : 1 case by Bruns, 1 by Fritzsche, 3 by Kocher, 1 by Reverdin, 1 by Wolkowitch, 1 by Hahn ; and because in the four instances in which somewhat fuller details are known to us (Brun's, Hahn's, Reverdin's, and Wolkowitch's) no pathognomonic lesions appeared to have been detected" (pp. 148, 149).

Dr. Semon then investigates the sources of error above enumerated, and demonstrates that, under all the categories, there is considerable possibility that error, attenuating in effect the evidence against operative myxœdema, has been made. In particular he finds that one thing is clear, namely, "that the frequency of aberring or accessory glands is a very frequent one." The section of his report which treats of this question is worthy of attentive study, and is evidently the fruit of much reading and thought.

The general results of supposed complete removal of the thyroid gland are next presented in a tabular form. No less than 408 cases, furnished by 56 operators, are catalogued. In no more than 69 of these was definite cachexia strumipriva, or operative myxœdema, known to have followed the operation. We append Dr. Semon's remarks upon this table.

"From this table the following results would appear to follow:

"In a total of about 408 intentionally complete thyroidectomies, performed by 56 different surgeons, there were 59 deaths in consequence of, or shortly after, the operation.

"In 20 cases the operation was performed for malignant disease of the thyroid gland.

"Deducting the cases of death from or shortly after the operation, the cases in which there was malignant disease of the thyroid gland, and the cases which were lost from observation almost immediately after the operation, there remain 298 cases in which total thyroidectomy was performed for simple goitre, and in which the patients are known to have fully recovered. Of these, in 277 instances the further fate of the patients could be followed up, with the result that in 22 cases in which the patients remained, or at any rate got well, either recurrence of goitre or development of accessory thyroid glands appears to have taken place; that in 186 cases the patients appear to have remained free from cachexia strumipriva without recurrence or development of accessory thyroids having taken place; and that in 69 cachexia strumipriva of a more or less severe type developed" (p. 164).

It comes out, from further examination of this table and an analysis of the cases in which the cachexia was observed, that of 57 cases in which sex was recorded, "the patients were male in 24 and female in 33 cases. There appears to be therefore by no means that preponderance of the female sex which is met with in primary myxœdema" (p. 167).

The age of the persons affected is also worthy of attention. Dr. Semon presents this in a table, to which he appends the following remarks:

"The great majority of the patients afflicted are between ten and thirty years old, which supports Kocher's view that the risk of cachexia developing is greater in individuals whose physical development is not yet entirely terminated. It must, however, not be forgotten that the great majority of operations have certainly been performed in patients between ten and thirty years of age, so that the large preponderance of these

two decades in our table ought not exclusively to be attributed to the greater liability of these ages to the disease. Our table shows, at any rate, that no age is actually exempt from it" (p. 167).

Reviewing next the evidence bearing on the main subject of inquiry, namely, "the question of the frequency of cachexia strumipriva in proportion to the total number of those patients who underwent total thyroidectomy on account of benign goitre, who recovered, and whose cases could be followed up further," the Reporter concludes that "the proportion of the cases of cachexia strumipriva to the cases in which the patients remained free, apparently without possessing any acting thyroid tissue, would therefore be 69 in 186, or about 1 in 3.

"Considering that if cachexia strumipriva actually depended upon the total loss of active thyroid tissue, this proportion ought not to be 1 in 3, but 1 in 1, the statistical inquiry merely appears to bring out with greater force the general impression which will have been gained by the perusal of the replies of our correspondents, viz. that our investigation directly negatived the hypothesis of such a connection" (p. 168).

He proceeds to deal effectively with the sources of error already set forth, but still finds himself unable to decide that total removal of the thyroid, where the operation is free from objection, and where there is no evidence of the existence of accessory thyroid glands, is necessarily followed by myxœdema.

Feeling the imperfection of the evidence on this point, he discusses the various suggestions offered in explanation of the undoubted sequence of myxœdema in a certain proportion of the cases submitted to operation. They are presented as follows:

"*a*. Deficient development or atrophy of the trachea, following the operation (Kocher).

"*b*. Injury to the recurrent laryngeal nerves caused during the progress of the operation, or due to inflammation, adhesions, cicatrisation following it (Baumgärtner).

"*c*. Injury to the sympathetic nerve (Baumgärtner).

"*d.* Mode of operation.

"*e.* Endemic influences;"

and are, one by one, as it appears to the Committee, successfully controverted. The Committee would observe that hypotheses (*a*), (*b*), (*c*), and (*d*) have been dealt with in a vigorous and effective way by Professor Horsley in his report, and that with regard to (*e*) the geographical distribution of cases lends no support to the contention.

When Dr. Semon, in his fairness, finally refuses to answer definitely the question, "What is the cause of cachexia strumipriva?" the Committee thinks that he might possibly have gone a little too far in his endeavours at being perfectly impartial, and that, in this connection, attention should be drawn to the fact mentioned by himself, viz. that the peculiar cachexia has not followed any other serious operation in the neck involving the great vessels and the sympathetic nerve. What applies to operation applies also to disease. The positive fact of the sequence occurring in one form only of operation among many having similiar associations takes a first position. It is the explanation of the non-occurrence of myxœdema in operative cases which has to be sought, not the justification of the clearly established fact that myxœdema follows one operation and no other.

Conclusions.—Finally, it may be stated that there is strong evidence that myxœdema, sporadic cretinism, endemic cretinism, cachexia strumipriva, and the operative myxœdema of animals are severally species of one genus; that such clinical differences as exist between them are due to causes already sufficiently set forth; and that the one pathological fact common to all these conditions is the occurrence of morbid processes or of operations involving the annihilation of the function of the thyroid body.

William M. Ord.

CONCLUSIONS.

The following are the final conclusions arrived at by the Committee :

1. That myxœdema is a well-defined disease.

2. That the disease affects women much more frequently than men ; and that the subjects are, for the most part, of middle age.

3. That clinical and pathological observations, respectively, indicate in a decisive way, that the one condition common to all cases is destructive change of the thyroid gland.

4. That the most common form of destructive change of the thyroid gland consists in the substitution of a delicate fibrous tissue for the proper glandular structure.

5. That interstitial development of fibrous tissue is also observed very frequently in the skin, and, with much less frequency, in the viscera; the appearances presented by this tissue being suggestive of an irritative or inflammatory process.

6. That pathological observation, while showing cause for the changes in the skin observed during life, for the falling off of the hair, and the loss of the teeth, for the increased bulk of the body, as due to the excess of subcutaneous fat, affords no explanation of the affections of speech, movement, sensation, consciousness, and intellect, which form a large part of the symptoms of the disease.

7. That chemical examination of the comparatively few available cases fails to show the general existence of an excess of mucin in the tissues adequately corresponding to the amount recorded in the first observation, but that this discrepancy

may be, in part, attributed to the fact that tumefaction of the integuments, although generally characteristic of myxœdema, varies considerably throughout the course of the disease, and often disappears shortly before death.

8. That in experiments made upon animals, particularly on monkeys, symptoms resembling in a very close and remarkable way those of myxœdema have followed complete removal of the thyroid gland, performed under antiseptic precautions, and with, as far as could be ascertained, no injury to the adjacent nerves or to the trachea.

9. That in such experimental cases a large excess of mucin has been found to be present in the skin, fibrous tissues, blood, and salivary glands; in particular the parotid gland, normally containing no mucin, has presented that substance in quantities corresponding to what would be ordinarily found in the submaxillary gland.

10. That the full analysis of the results of the removal of the thyroid gland in man demonstrates, in an important proportion of the cases, the fact of the subsequent development of symptoms exactly corresponding with those of myxœdema.

11. That in no inconsiderable number of cases the operation has not been known to have been followed by such symptoms; the apparent immunity being in many cases probably due to the presence and subsequent development of accessory thyroid glands, or to accidentally incomplete removal, or to insufficiently long observation of the patients after operation.

12. That, whereas injury to the trachea, atrophy of the trachea, injury of the recurrent laryngeal nerves, injury of the cervical sympathetic, and endemic influences, have been by various observers supposed to be the true causes of experimental or of operative myxœdema (cachexia strumipriva), there is, in the first place, no evidence to show that, of the numerous and various surgical operations performed on the neck and throat, involving various organs and tissues, any, save those in which the thyroid gland has been removed, have been followed by the symptoms under consideration; that in many of the operations on man, and in most, if not all, of the experimental operations made by Professor Horsley on

monkeys and other animals, this procedure avoided all injury of surrounding parts, and was perfectly aseptic; that myxœdema has followed removal of the thyroid gland in persons neither living in, nor having lived in, localities the seat of endemic cretinism; that, therefore, the positive evidence on this point vastly outweighs the negative; and that it appears strongly proved that myxœdema is frequently produced by the removal, as well as by the pathological destruction, of the thyroid gland.

13. That whereas, according to Clause 2, in myxœdema, women are much more numerously affected than men, in the operative form of myxœdema no important numerical difference is observed.

14. That a general review of symptoms and pathology leads to the belief that the disease described under the name of myxœdema, as observed in adults, is practically the same disease as that named sporadic cretinism when affecting children; that myxœdema is probably identical with cachexia strumipriva; and that a very close affinity exists between myxœdema and endemic cretinism.

15. That while these several conditions appear, in the main, to depend on, or to be associated with, destruction or loss of the function of the thyroid gland, the ultimate cause of such destruction or loss is at present not evident.

William M. Ord, *Chairman.*

John Cavafy.	Victor Horsley.
Arthur E. Durham.	Sydney Jones.
Rickman J. Godlee.	Stephen Mackenzie.
James F. Goodhart.	Felix Semon.
W. D. Halliburton.	W. Pugin Thornton.
Warrington Haward.	W. B. Hadden, *Hon. Secretary.*

APPENDIX.

ON THE

WEIGHT OF THE THYROID BODY

AT DIFFERENT PERIODS OF LIFE AND IN PERSONS DYING FROM VARIOUS CAUSES.

It is generally stated in anatomical text-books, and in treatises dealing with the thyroid body, that the weight of this organ varies from one to two ounces, and that it is always larger in the female than in the male. It is difficult to trace the record of the facts on which these statements are founded. Most writers quote Krause as their authority, "In the fœtus and during early infancy this organ is relatively larger than in after-life; its proportion to the weight of the body in the new-born infant being that of 1 to 240 or 400, whilst at the end of three weeks it becomes only 1 to 1160, and in the adult 1 to 1800" (Quain and Sharpey).*

Huschke ("Traité de Splanchnologie," 'Encyclopédie anatomique,' trans. by A. L. Jourdan, 1845, p. 275) gives the average relative weight of the thyroid body to the body weight as 1 to 1800—1900. He found the proportion 1 to 400—243 in the new-born, 1 to 1166 at the end of the third week, 1 to 1800 in the adult. The correspondence between these two sets of figures is so close as to warrant a suspicion that they own a common origin. What value attaches to them it is difficult to arrive at, as the cause of death and the

* Dr. Thane, in reply to inquiries, has kindly favoured me with the following information:—"I find that the reference to Krause is an error—one of those errors which creep into a text-book in a mysterious way, and then pass through edition after edition. It appears first in the 5th edition of 1848, and 'Krause' must have been allowed to slip in for 'Huschke.' Probably other text-books have copied from Quain. The original statement is in S. J. v. Sömmering's 'Vom Baue des menschlichen Körpers,' Band v, 'Lehre von den Eingeweiden und Sinnesorganen des menschlichen Körpers,' umgearbeitet und beendigt von C. Huschke. Leipzig, 1844, S. 299."

state of nutrition of the body are considerations that cannot be put aside in estimating the normal relation between the body weight and the weight of the thyroid gland. In persons dying from various causes the condition that brought about death may have influenced, or been influenced by, the state of the thyroid body. It is only in persons killed quickly by accident, and whose organs are found in a healthy condition, that the normal relative weight can be safely estimated. Such cases, it is needless to remark, are in the experiences of pathologists and anatomists few in number, and the records of the relative weight of the thyroid gland and the body in such cases a desideratum.

It is important, however, to have some knowledge of the *usual* weight of the thyroid body at various ages in persons dying from various causes, as we are thereby enabled to appraise at a more correct value the weight of the thyroid in myxœdema and allied conditions.

Dr. Stephen Mackenzie has published ('Medico-Chirurg. Trans.,' vol. lxvii, p. 277) a series of eighty-four observations on the weight of the thyroid body in persons dying from various causes. These observations are arranged in a Table (which is reproduced on pp. 208, 209), giving the sex and age of the patient, the body weight, the state of nutrition, and the cause of death. Dr. Mackenzie is of opinion that the observations are too few in number to allow of safe deductions, but at the request of the Committee has appended to his Table various analyses of the facts which show the direction in which the facts recorded tend.

Actual Weight of Thyroid Body arranged according to Decades.

No. of decade.	No. of observations.	Males. dr. gr.	No. of observations.	Females. dr. gr.
1	... 1	0 32	... 2	1 11
2	... 3	4 13	... 3	4 5
3	... 11	4 53	... 5	3 54
4	... 12	5 18	... 2	3 38
5	... 16	4 46	... 6	3 15
6	... 10	4 40	... 1	2 45
7	... 6	4 2	... 1	6 44
8	...	4 32		

Though no case in this series occurred in the earliest infancy, yet no striking influence appears to be exercised on the weight of the thyroid body by age alone. Neither do these figures support the usual statement that the organ is larger in the female than in the male.

Further analysis shows the mean weight of the thyroid body in this series is for *males* (sixty-four) 4 drachms 38 grains, and for *females* (twenty) 3 drachms 31 grains.

The figures are next worked out in reference to the state of nutrition of the body, and in two diseases, phthisis and Bright's disease.

Actual Weight of Thyroid Body in relation to Nutrition, &c.

	Males. No. of observations.	Males. dr. gr.	Females. No. of observations.	Females. dr. gr.
Nutrition of body normal.....	18	6 40	1	4 28
Body slightly wasted.....	14	4 58	4	3 22
Body much wasted.....	18	4 4	8	3 40
Body emaciated	8	3 38	4	3 16
Body stout	4	3 18	2	4 8
Body œdematous	2	5 16	1	1 37
Death due to phthisis	7	3 39	4	4 2
Death due to Bright's disease ...	4	4 39	3	3 38

Converting these actual into relative weights, the following results are obtained.

Relative Weight of Thyroid Body arranged in Decades (both Sexes).

No. of decade.	No. of observations.	Relative weight of thyroid gland to body.
1	2	1 to 531
2	6	1 „ 357
3	10	1 „ 559
4	14	1 „ 457
5	19	1 „ 562
6	7	1 „ 647
7	6	1 „ 456
8	5	1 „ 701

Arranged in this way, again, there does not appear to be any definite proportion between the weight of the thyroid

Table of the Weight of the Thyroid Body in Persons dying from various causes.

MALES.						FEMALES.					
	Age.	Nutrition of body.	Weight of body in lbs.	Weight of thyroid body. drm.	gr.	Cause of death.	Age.	Nutrition of body.	Weight of body in lbs.	Weight of thyroid body. drm.	gr.	Cause of death.
Under 5	1½	Normal	18	0	32	Acute tuberculosis.	4	Much wasted	—	0	45	Tubercular meningitis.
5 to 9	—	—	—	—		—	9	Œdematous	53	1	37	Acute nephritis.
10 to 14	11	Slightly wasted	65	2	19	Pyæmia.						
	12	Normal	70	3	44	Ruptured abdominal viscera.	12	Slightly wasted	59	2	3	Heart disease.
15 to 19	15	„	67	6	36	Accident.	18	Much wasted	103	5	46	„
							19	Normal	140	4	28	Peritonitis.
20 to 24	22	„	177	7	45	Fractured spine.	20	Much wasted	—	1	51	Heart disease.
	22	Slightly wasted	146	4	4	Rheumatic pericarditis.	23	Slightly wasted	—	4	24	Phthisis.
	22	Much wasted	155	3	9	Acute tuberculosis.						
	22	Normal	—	8	19	Enteric fever.						
	24	Stout	210	3	3	Heart disease.						
25 to 29	25	Slightly wasted	—	5	37	„	25	Much wasted	—	4	33	Myelitis.
	26	Normal	176	7	55	Fractured spine.	25	„	110	4	10	Acute phthisis.
	27	Slightly wasted	—	4	22	Stricture of urethra.	25	Stout	127	4	32	Heart disease.
	27	Much wasted	133	4	0	Pyæmia.						
	28	Slightly wasted	147	2	8	Bronchitis, emphysema.						
	29	Stout	170	3	24	Lithotomy.						
30 to 34	30	Much wasted	133	5	28	Cirrhosis of liver.						
	30	„	133	4	21	Tuberculosis.						
	31	Slightly wasted	182	5	18	Typhus.						
	31	Much wasted	134	3	47	Phthisis.						
	33	Emaciated	130	6	4	Abscess of shoulder.	32	Slightly wasted	140	4	11	Blood cyst of spleen.
	34	Much wasted	168	6	16	Aneurism of aorta.						
35 to 39	35	Slightly wasted	238	10	36	Cirrhosis of liver.						
	35	Normal	147	5	57	Poisoning by mercuric chloride.						
	36	Slightly wasted	126	3	56	Phthisis.						
	36	Emaciated	150	3	53	Heart disease.						
	38	Normal	149	5	7	Fractured skull.	38	Emaciated	114	3	6	Diabetes.
	38	Emaciated	118	2	56	Abdominal cancer.						
40 to 44	40	Much wasted	136	3	41	Paraplegia.	40	„	96	2	44	Cancer of uterus.

	40	Œdematous	231	6	33	Acute nephritis.					
	41	Slightly wasted	—	3	35	Hernia, erysipelas.					
	41	Much wasted	147	3	59	Phthisis.					
	42	Normal	139	6	40	Bronchitis and emphysema.	42	Much wasted	119	2	46	Phthisis.
	42	Emaciated	119	3	50	Phthisis.					
	43	Slightly wasted	168	2	51	,,	43	Emaciated	119	4	51	,,
	43	,,	210	9	16	Heart and kidney disease.					
45 to 49	45	Emaciated	126	3	17	Phthisis.	45	Stout	—	3	45	Strangulated hernia.
	45	Normal	154	4	38	Aneurism of aorta.					
	46	Much wasted	119	3	58	Phthisis.	46	Emaciated	112	2	35	Chronic Bright's disease.
	46	Œdematous	224	3	59	Chronic Bright's disease.					
	47	Slightly wasted	182	5	38	Heart disease.					
	48	Stout	202	4	25	Cerebral hæmorrhage.					
	49	Normal	—	5	11	Erysipelas.	49	Slightly wasted	139	2	50	Scirrhus of breast and lung.
	49	Much wasted	148	4	54	Chronic peritonitis.					
50 to 54	50	Normal	—	6	28	Shock.	50	Much wasted	133	2	45	Capillary bronchitis.
	52	,,	—	4	14	Comp. fracture of leg.					
	52	,,	168	7	20	Cancer of stomach.					
	54	Much wasted	148	3	46	Acute tuberculosis.					
	54	,,	—	4	45	Cerebro-spinal meningitis.					
55 to 59	56	Normal	210	5	3	Bright's disease.					
	56	,,	173	3	30	Pyæmia.					
	56	Much wasted	130	3	1	Chronic Bright's disease.					
	58	Emaciated	—	2	23	Stricture of œsophagus.					
	59	Much wasted	139	3	40	Bronchitis.					
60 to 64	60	Slightly wasted	—	6	9	Aneurism of aorta.	60	,,	112	6	44	Chronic Bright's disease.
	61	Stout	184	2	23	Umbilical hernia.					
	62	Much wasted	147	5	3	Prostatic disease, bronchitis.					
	63	Slightly wasted	158	3	51	Cerebral hæmorrhage.					
65 to 69	68	Much wasted	127	3	46	Prostatic disease.					
	69	Emaciated	160	3	5	Stricture of œsophagus.					
70 to 74	70	Normal	217	9	41	Prostatic disease.					
	72	Much wasted	138	2	49	,,					
	74	,,	217	2	56	Erysipelas from injury.					
	74	Emaciated	130	3	41	Prostatic disease.					
75 to 79	79	Normal	133	3	26	Injury, run over.					

gland and the body weight in regard to age, though it is possible such proportion, if existing at any time, may have been disturbed by the conditions that brought about death.

In the youngest case recorded, a male, aged one and a half years, the relative weight was 1 to 540; in the oldest, a male, aged seventy-nine years, it was 1 to 619.

Relative Weight of Thyroid Body in relation to Nutrition of Body, and Average Relative Weight.

	No. of observations.	Males.		No. of observations.	Females.
Nutrition normal ...	14	1 to 431	...	1	1 to 501
Slightly wasted	10	636	...	3	628
Much wasted	17	588	...	5	487
Emaciated	7	552	...	3	493
Stout	4	425	...	1	448
Œdematous	2	731	...	1	524
Average	54	560·5	...	14	513·5

It will be seen from the facts arranged in different ways that there is a general correspondence with regard to age, and in relation to the nutrition of the body, between the two sexes; but the limited number of facts here available only allow of one safe deduction, that the thyroid body in disease shares, in some measure, the nutritional changes occurring in other organs.

Stephen Mackenzie.

BIBLIOGRAPHY OF MYXŒDEMA.

Observer's name.	Title of paper.	Reference.
Abbott	A Case of Myxœdema	Brit. Med. Journ., 1886, vol. i, p. 1212.
Allan	Myxœdema: Death: Necropsy	Brit. Med. Journ., Feb. 9, 1884.
Anderson.....	A Case of Myxœdema	Clin. Soc. Trans., vol. xviii.
Atkinson.....	Notes on a Case of Myxœdema	Proc. W. Lond. Med.-Chir Soc., 1887.
Ballet	Cachexie pachydermique	Progrès Méd., July, 1880.
Barling	Necropsy of a case of Myxœdema ...	Lancet, 1886, vol. ii, p. 970
Blaise	De la cachexie pachydermique	Arch. de Neurolog., 1882, Nos. 7 and 8.
Botkin.....	Myxoedema	Ejened. klin. gaz. St. Petersb., 1887.
Bourneville and D'Olier	Note sur un cas de cretinisme avec Myxœdème	Progrès méd., 1880, No. 35.
Brandes	Un cas de Myxœdème	Cong. période. internat. des sc. méd., Copenh., 1886.
Bryant.....	A Case of Myxœdema	New York Med. Rec., 1886.
Campana ...	Mixœdema	Italia Medica, Sept. and Oct., 1883.
Cavafy.....	Two Cases of Myxœdema.....	Clin. Soc. Trans., vol. xv.
Charcot	Myxœdème, cachexie pachydermique, ou état cretinoide	Gaz. des Hôpit., 1881, No. 10.
Charpentier .	Nouveau cas de Myxœdème.....	Progrès méd., No. 5, 1882.
Chevallereau .	Myxœdème aigu consécutif à l'extirpation du corps thyroïde	France Méd., 1886.
Clunn	Myxœdema following Hæmorrhage...	Brit. Med. Journ., April 7, 1883.
Coxwell	Child with Symptoms resembling Myxœdema	Clin. Soc. Trans., vol. xvi.
Cushier	Case of Myxœdema	New York Med. Rec., Aug. 19, 1882.
Davies	A Case of Myxœdema in a Male	Clin. Soc. Trans., vol. xx.
Davies	A Case of Myxœdema	Clin. Soc. Trans., vol. xx.
De Barbieri...	Un Caso di Mixedema	Italia Med., 1885.
De Ranse.....	La cachexie pachydermique.....	Gaz. Méd., Dec., 1880.
Drewitt	Case of Myxœdema	Clin. Soc. Trans., vol. xvii.
Duckworth ...	On a Case of Myxœdema, or Universal Mucoid Degeneration of the Connective Tissue of the Body	Clin. Soc. Trans., vol. xiii.

Observer's name.	Title of paper.	Reference.
Duckworth ...	Two Cases of Myxœdema.....	Clin. Soc. Trans., vol. xiv.
Dunlop	Case of Myxœdema	Australasian Med. Gaz., July, 1883.
Erb	Ueber Myxœdema	Berl. klin. Wochenschr., 1887.
Fiesinger ...	Contribution à l'étude de la cachexie pachydermique	Revue Méd. de l'Est, 1881, p. 301.
Fournier	Un cas de Myxœdème	Gaz. hebd. de Méd. et de Chir., No. 4, 1882.
Fraser	A Case of Myxœdema, with Recovery, which was marked by Profuse Perspiration	Med. Times and Gaz., Oct. 15, 1884.
Fuchs	Myxœdem	Prag. med. Wochenschr., 1887.
Goodhart.....	A Case which presented the Clinical but not the Pathological Characteristics of Myxœdema	Clin. Soc. Trans., vol. xv.
Goodhart.....	Sporadic Cretinism and Myxœdema...	Med. Times and Gaz., May, 1880.
Gordon	Myxœdema following upon Removal of the Thyroid Gland	Lancet, 1886, vol. ii, p. 65.
Gowans	History of a Case of Myxœdema.....	Brit. Med. Journ., May 27, 1882.
Grocco..... .	Il Mixœdema e la Malattia del Bright	Ann. Univ. di Med., 1882.
Guerlain	Myxœdema	Brit. Med. Journ., Feb. 3, 1883, p. 224.
Gull	On a Cretinoid State supervening in Adult Life in Women	Clin. Soc. Trans., vol .vii .
Hadden	A Case of Myxœdema	Clin. Soc. Trans., vol. xiv.
Hadden	Medical Report	St. Thos. Hosp. Rep., 1879 and 1885.
Hadden	Sur le Myxœdème	Progrès Méd., July. 1880.
Hadden	The Nervous Symptoms of Myxœdema	Brain, 1882.
Hadden	Myxœdema and its Pathology	Cong. période. internat. des sc. méd., Copenh., 1886.
Hamilton (A. McL.)	A Case of Myxœdema	New York Med. Rec., Dec. 9, 1882.
Hamilton (A. McL.)	A Case of Myxœdema in the Male ...	Journ. Nerv. and Ment. Dis., N.Y., 1885.
Hammond ...	On Myxœdema, with special reference to its Cerebral and Nervous Symptoms	Neurolog. Contrib., 1881, vol. i, No. 3.
Handford ...	A Case for Diagnosis; Myxœdema or Elephantiasis	Clin. Soc. Trans., vol. xix.
Harley	The Pathology of Myxœdema as illustrated in a Typical Case	Med.-Chir. Trans., vol. lxvii.
Haw	Hæmorrhage in Myxœdema.....	Lancet, 1888, vol. i.
Henrot	Des lésions anatomiques et de la nature du Myxœdème	Union Méd. de Nord-est, Dec., 1882.
Holland	Remarks upon a Case of Myxœdema	American Practitioner, Sept., 1882.
Hopkins	Case of Myxœdema	Lancet, Dec. 10, 1881.

Observer's name.	Title of paper.	Reference.
Hopkins	Case of Myxœdema	Lancet, Dec. 10, 1881.
Hopkins	Two Cases of Myxœdema	Clin. Soc. Trans., vol. xviii.
Horsley	The Thyroid Gland; its Relation to the Pathology of Myxœdema and Cretinism, &c.	Brit. Med. Journ., 1885, vol. i, p. 111.
Horsley and Gordon	Myxœdema (Rev.).....	Asclepiad, 1886, iii, 281.
Inglis	Two Cases of Myxœdema.....	Lancet, Sept., 1880.
Jeanselme and Lermoyez	Du Myxœdème et de ses modifications chez les cholériques	Gaz. hebd. de Méd., 1885.
Kielland	To Tilfoelde af Myxœdema chronicum	Norsk Mag. f. Lægevidensk., Christiania, 1887.
Kinnier	The History of Myxœdema, with the Report of a Case	New York Med. Record, 1885.
Kirk	On a Case of Myxœdema	Glasgow Med. Journ., Jan. 1, 1884.
Landau	Ueber Myxœdema	Berl. klin. Wochenschr., 1887.
Landouar ...	Une observation de Myxœdème	Par., 1887, 33 pp. 4to.
Lattey.....	Report on a Case of Myxœdema	Lancet, June 29, 1882.
Lediard	Case of Myxœdema	Lancet, April 30, 1881.
Lloyd	Report of Case of Myxœdema	Clin. Soc. Trans., vol. xiv.
Lunn	Two Cases of Myxœdema.....	Clin. Soc. Trans., vol. xv.
Lunn	A Case of Myxœdema (?) and Want of Development of the Genital Organs	Clin. Soc. Trans., vol. xx.
Lunn	Cases of Myxœdema	Clin. Soc. Trans., vol. xvi.
Lussana	Mixœdema o Sclerodermia ?.....	Ann. Univ. di Med. e Chir., Milano, 1886.
Mackenzie(S.)	Myxœdema in a Male	Clin. Soc. Trans., vol. xvi.
Mahomed ...	Case of Myxœdema improving under Treatment	Clin. Soc. Trans., vol. xv.
Mahomed ...	The Pathology and Etiology of Myxœdema	Lancet, Dec. 24, 1881.
Marcus	Contribution à l'étude clinique du Myxœdème	Thèse de Paris, 1886.
Mayor	La cachexie pachydermique.....	Rev. méd. de la suisse Rom., Sept. 15, 1883.
Mercer.....	Myxœdema	New York Med. Record, April 16, 1881.
Merklen	Cachexie pachydermique	Ann. de Dermat. et de Syph., 1881.
Miller	A Case of Myxœdema	Brit. Med. Journ., 1885, vol. i, p. 429.
Morvan	Contribution à l'étude du Myxœdème	Gaz. hebd. de Med. et de Chir., 1881.
Moulin.....	Case of Myxœdema	Lancet, July 9, 1881, p. 54.
Nixon	A Case of Myxœdema	Dublin Journ. Med. Sc., 1887.
Olive	Sur le Myxœdème	Arch. Gén. de Méd., June, 1879.
Oliver	Clinical Lecture on Myxœdema	Brit. Med. Journ., March 17, 1883.

Observer's name.	Title of paper.	Reference.
Ord	On Myxœdema, a term proposed to be applied to an essential condition occasionally observed in Middle-aged Women	Med.-Chir. Trans., vol. lxi.
Ord	Clinical Lecture on Myxœdema	Brit. Med. Journ., May, 1878.
Ord	Cases of Myxœdema	Clin. Soc. Trans., vol. xiii.
Ord	A Case of Myxœdema with appearance of General Paralysis and Mental Irritability	Clin. Soc. Trans., vol. xv.
Paton	Case of Myxœdema	Glasgow Med. Journ., 1887.
Reverdin	Contribution à l'étude du Myxœdème consécutif à l'extirpation totale ou partielle du corps thyroïde	Cong. franç. de Chir. Proc.-verb., 1887.
Reverdin	Contribution à l'étude du Myxœdème consécutif à l'extirpation totale ou partielle du corps thyroïde	Rev. méd. de la suisse Rom., 1887.
Ribbert	Die neueren Beobachtungen über die Function der Schilddrüse und das Myxœdem	Deutsche med. Wochenschr., Leipzig, 1887.
Ridel Saillard	De la cachexie pachydermique	Thèse de Paris, 1881. See Gaz. des Hôpit., 1881, p. 849.
Riess	Ueber einen Fall von "Myxœdem".	Berl. klin. Wochenschr., 1886.
Roberts	Report and Presentation of a Case of Myxœdema	Planet (U.S.), Oct. 15, 1883.
Robinson	Myxœdema	Chicago Med. Journ. and Exam., Nov., 1883.
Robinson (T.)	Case of Myxœdema	Trans. Willan Soc., 1885.
Savage	The Nervous Symptoms of Myxœdema	Journ. of Mental Science, Jan., 1880.
Savill	A Case of Myxœdema in the Male	Med. Soc. Proc., vol. ix.
Savill	Case of Myxœdema	Clin. Soc. Trans., vol. xix.
Semon	A Case of Myxœdema	Clin. Soc. Trans., vol. xiv.
Seppilli	Del Missœdema o cachessia pachydermica	Rev. sper. di Fren. e Med. leg., 1882.
Shelswell	Cases of Hæmorrhagic Tendency in Myxœdema	Lancet, 1887, vol. i, p. 675.
Stowart	Myxœdema appearing during the Course of Chronic Tetany	Canada Med. and Surg. Journ., 1887—1888.
Stokes	Acute Myxœdema following Thyroidectomy	Brit. Med. Journ., 1886, vol. ii, p. 709.
Suckling	Myxœdema	Brit. Med. Journ., April 7, 1883.
Suckling	Case of Myxœdema	Brit. Med. Journ., April 14, 1883.
Suckling	Myxœdema	Birmingh. Med. Rev., Mar., 1884.
Suckling	Case of Myxœdema in a Woman aged Seventy-six	Lancet, 1885, vol. i, p. 889.
Suckling	Sequel to a Case of Myxœdema in a Woman aged Seventy-six	Lancet, 1886, vol. i, p. 918.

Observer's name.	Title of paper.	Reference.
Thaon	Cachexie pachydermique	Revue Mens. de Méd. et de Chir., Aug., 1880.
Ujealusy	A Myxo-œdemáról.....	Orvosi Netil., Budapest, 1887.
Verriest	Cas de Myxœdème (cachexie pachydermique de Charcot, &c.)	Art. Méd., Brux., 1886–87, xxii, 185—190; also Rev. Méd., Louvain, 1886, v, 193—199.
Verriest	Cas de Myxœdème.....	Bull. Soc. de Méd. ment. de Belg., Gand et Leipz., 1886, No. 41, 61—63.
Virchow	Ueber Myxoedema.....	Wien med. Bl., 1887; also Berl. klin Wochenschr., 1887.
Von Noorden	Der gegenwärtige Stand der Lehre von der Bedeutung der Schilddrüse. II. Zur Entwicklung der Myxœdemfrage	München. med. Wochenschr., 1887.
Wadsworth .	A Case of Myxœdema with Atrophy of the Optic Nerves	Boston Med. and Surg. Journ., 1885.
Warfvinge ...	Ett fall af Myxœdema	Hygïea, Stockholm, 1887.
Wewer	Ein Fall von Myxödema	Frauenarzt, Berlin, 1887.
White (E. W.)	A Case of Myxœdema associated with Insanity	Lancet, May 31, 1884.
White (W. Hale)	A Case of Myxœdema, with a Post-mortem Examination	Clin. Soc. Trans., vol. xviii.
Whipham ...	A Case of Myxœdema with Microscopic Appearances in some of the Organs	Med. Soc. Proc., vol. viii.
Zielewicz.....	Ein Fall von Myxœdem mit starker Stomatitis und Hepatitis interstitialis	Berl. klin. Wochenschr., 1887.

No.	Observer's name.	Initials of patient.	Age.	Sex.	Social condition.	Family antecedents.	Personal antecedents.								Bulk.	Weight.	Physiognomy.	State of skin.					Nails.	Hair.	State of thyroid, past and present.	Temperature.			Presence of watery dropsy (pitting, ascites).	Sensation.				Subjective sensations.	Cephalic headache.
							Syphilis	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.				Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.				Axillary.	Of surface.	Of internal parts.		Lost.	Perverted.	Delayed.	Of heat and cold.		
1	Allan	—	67	F.	Servant	Phthisis in family	No	Yes	—	Began at 20; dysmenorrhœa	None	None	64	Eyelids and hands	London	Spare	120 lbs.	Without expression	Œdema of eyelids and under eyes, face rather swollen, pink colour on cheeks	Dry and glisteoing, cutaneous lymphatics enlarged and tense	Fulness and rigidity	Swollen	Great pallor of fingers, hands not deformed, skin as on body	Dry and cracked	Scanty	—	95° to 97°	—	—	No	—	—	Yes	—	Occasional rheumatic pains in limbs and joints; always feels cold; painful flexion of toes	Married and permanent
2	Anderson	J. A.	40	F.	Single, a nurse in comfortable circumstances	Father died at 74 of ulceration of bowels; mother at 57 of hæmorrhage, with coffee-ground vomiting; 5 brothers and sisters alive and healthy; 3 brothers dead from accident, &c.	No	No	No	Regular from age of 14; frequently after it has ceased for a few days, it commences again and lasts for 3 weeks, leaving her much exhausted	—	—	31	Eyelids and hands	32 years in Liverpool, 8 years in Kendal	5 ft. 7 in. in height; 36½ in. below nipples, 34 in. below umbilicus	10½ st.	—	Dry, brawny, no perspiration, small mole on right cheek, defined scarlet flush on cheeks and nose, with waxy pallor round eyes, lids swollen, lips thick and blue	Dry and brawny, no perspiration	Full and elastic, no actual tumour	—	Hands swollen, red, clumsy looking; hands and feet always cold	Stunted, tend to split unless kept very short	Falling off for the last 9 years	Uncertain, probably atrophied	1° to 1·5° below that of mouth	Average 98·5°, but very variable	In mouth 98·5° on average; varied from 97·8° to 99·2°	None	No	No	No	Normal	Hot sensations at vertex of head	None
3	Ballet	F.	57	M.	Middle-class	—	—	—	Money troubles	—	—	—	50	Face and limbs	Paris	—	—	Mask-like	Swollen, wax-like; eyelids swollen, drooping; lips everted, livid	Swollen, scaly, pachydermatous	—	—	Swollen, thick, hard, scaly, pachydermatous, cold, and hard	Broken off	Scanty; bald patches	—	—	—	—	None	—	—	—	—	Pricking sensations of the skin	—
4	Blaise	H. A.	34	F.	—	Father died at 65 of chronic bronchitis; mother of similar cause at 67; 1 brother, age 44, healthy	No trace	—	—	Began at 11; regular, but profuse	None	None	About 21	—	Montpellier, France	Increased	—	Mask-like, expressionless	Eyelids swollen and transparent; thick, everted lips; forehead wrinkled	Swollen and thick, especially neck; little perspiration	—	—	Hands swollen, thick, dry, scaly; arms and legs swollen	—	Falling from scalp for 4 or 5 years; bald patches	—	36·5° to 39·4° C. (97·7° to 102·9° F.), generally about normal	Front of forearm 31 6° C. (88·8° F.); neck 35·4° C. (95·7° F.)	—	None	No	No	No	Diminished	Burnings and prickings of skin, coldness, water trickling down the limbs, temporal headache	—
5	Bowles	C. A.	33	F.	Lower class	Mother died after amputation of breast; a sister died, æt. 27, of diabetes; 1 brother healthy	No	No	No	Irregular and excessive	1	1, died at 12 days, not born since present illness	Weak and poorly after marriage, 12 years ago	Stomach and legs	—	—	Increased	Cretinoid	Dry, pale; no venous engorgement; lips dusky	Dry and pale	Normal	Normal	Hands purple and puffed	—	Weak and thin on forehead and eyebrows	—	—	—	—	Very slight pitting on long pressure	No	No	No	Normal	Soreness on top and right side of head	—
6	Campana	—	57	M.	Ropemaker	—	—	—	—	—	—	—	Some years	Face	Geneva	—	57,500 kilog.	Broad, swollen, porcelainous	Waxy, dry, wrinkled, thick	Waxy, dry, wrinkled, thick	—	—	Skin 5 to 7 mm. thick in upper extremities; hands a little swollen, skin dry and pale; lower limbs cylindrical; feet broad and flattened	Wanting, or thickened and brittle	Thick, with bald patches	—	36·6° to 37·2° C. (98·7° to 98·9° F.)	—	In mouth, 37·1° to 37·5° C. (98·7° to 99·5° F.); in rectum, 37·1° to 37·6° C. (98·7° to 99·6° F.)	—	Slight diminution of sensibility to touch and pain	—	—	—	—	—	—
7	Cavafy	M. A. W.	63	F.	Unmarried, comfortable circumstances	Good family history	No	No	No	—	None	—	45	Face	—	Stout, heavy	—	Dull and expressionless	Waxy swelling of eyelids and temples, congested lips	Dry and rough	—	—	Broad hands, swollen feet; skin rough, dull red, brawny, not much thickened	Rather cracked	Scanty, grey	—	Subnormal (average 96·4°)	—	—	Occasional pitting, œdema of ankles	No	No	Yes	—	Constant aching of loins, constant feeling of cold	Frequently
8	Cavafy	F. E.	59	F.	Married, comfortable circumstances	Good family history	No	No	Mental shock 5 years ago	Always normal, ceased at 45	10; 4 miscarriages, not consecutive	5, all reported healthy; none born after myxœdema	54	Hands	Born at Guildford, and lived there until æt. 25; Cheam ever since	Moderate, middle height	—	Dull expression	Waxy swelling of upper part and eyelids, pigmentation, congested cheeks	Rough, dry, and red on neck, normal elsewhere	No soft swellings	—	Skin easily pinched up, rough, dry, and red; hands swollen, feet less so	Normal	Scanty, brown; eyebrows and eyelashes very scanty	Past not noted, present uncertain	Subnormal (average 96·6°)	—	—	None	No	No	Yes	—	Always felt cold, frontal headache at times	No
9	Cavafy	S. S.	33	F.	Married, comfortable circumstances	Good family history	No	No	No	Normal	5	5; 3 died in infancy of convulsions; 1 born after establishment of myxœdema	28, after child-birth	Eyelids	Lyndhurst from 16 to 22; Chelsea since	Moderate, tall	—	Placid	Much transparent swelling of eyelids; congested cheeks, lips, and nose	Rather dry, harsh, and thick	No soft tumours	—	Swollen; skin rather thick, red, rough, dry	Normal	Abundant, except eyebrows, dark brown	Past not noted, present uncertain	Subnormal (average 97·6°)	—	—	None	No	No	Yes	—	Always felt chilly	No
10	Charpentier	—	37	F.	Single, charcoal-burner	Mother died of dropsy at 61; no insanity or epilepsy	No	(?)	—	Began at 16; normal, more profuse the last 4 years	None	None	27	Left ankle	Near Paris	—	—	—	Œdematous looking, rose tint across nose	Soft, smooth, glazed, white, no eruption	Nothing	Swollen	Swollen	Nothing	Nothing	Nothing abnormal	—	—	—	—	No	No	No	—	Noises in the ear, vertigo	No
11	Clunn	—	?	F.	Wife of farm labourer	—	—	—	Probably yes	Absent since last confinement	Much flooding after last confinement, since which symptoms dated	4 or 5	—	—	—	—	—	Apathetic, heavy, sleepy-looking, eyes partially open	Bloated, anæmic	Firm, non-pitting œdema	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Always cold	—

TABULATED CASES OF MYXŒDEMA.

Sensation.			Occipital headache.	Motion.				Convulsions.	Reflexes.	
[illegible]	Delayed.	Of heat and cold.	Subjective sensations.	Paralysis.	Paresis.	Retardation	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.
Yes	—	Occasional rheumatic pains in limbs and joints; always feels cold; painful flexion of toes	Marked and persistent	No	Yes, of lower limbs	Yes	No	No	Diminished	Diminished
No	Normal	Hot sensations at vertex of head	None	None	None	Movements slow and deliberate, but sure	A fall whilst in hospital, none before	None	No plantar reflex	Knee-jerk normal
—	—	Pricking sensations of the skin	—	—	Yes	Gait slow	—	—	—	—
No	Diminished	Burnings and prickings of skin, coldness, water trickling down the limbs, temporal headache	—	—	—	—	—	—	—	—
No	Normal	Soreness on top and right side of head	—	No	No	Yes	No	No	Normal	—
—	—	—	—	—	Right hand 35 kilos, left 40	Yes	Slight trembling of upper extremities	—	—	Normal
Yes	—	Constant aching of loins, frontal feeling of cold	Frequently	No	No	Very slow, weak and awkward movements	Not obvious only; complete loss of consciousness, followed by vomiting	Yes, once	—	—
Yes	—	Always felt cold, frontal headache at times	No	No	No	Yes, all movements	Awkwardness only, has fallen, no injury	No	Diminished	Diminished
Yes	—	Always felt chilly	No	No	No	Yes, general	Awkwardness and slowness only; several falls, no injuries	None	Diminished	Diminished
No	—	Noises in the ear, vertigo	No	No	No	No	No	Probably nocturnal	Nothing abnormal	Nothing abnormal
—	—	Always cold	—	—	? Yes	—	—	—	—	—

Intellectual changes.														Circulatory system.					Respiratory system.	
Sowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.	
Yes	No	Imperfection	Unable to write	Occasional	Does not sleep well	Thought people talked about her	Of smell	Defective	—	—	Slow, monotonous, nasal	Impaired	Rather deaf	Defective	Very defective	—	—	—	—	—	—
Slow in answering, but quite intelligent, although little mental spontaniety	No	Perfect, but slow	Flowing and firm	No; placid, but occasionally has "fidgets" and cannot sit still	Usually fair, but not unfrequently wakeful, cannot tell why	None	None	Excellent	None	None	Slow and somewhat thick for 9 years cataract of although centre clear; left lens quite clear; general haze of both retinæ, with no localised disease	Hm. of R. = +11 D., giving $\frac{6}{18}$; of left = +0·5 D., giving $\frac{6}{18}$; commencing	Hearing slightly dull	Good	Good	—	Normal, but sounds somewhat feeble	Pulse 68, feeble	Not distended	Defined flush on cheeks and nose; no sudden flushes; redness of hands; pallor round eyes and mouth
Yes	Yes, in thought	—	Writes very slowly	Yes	Sleeps much	—	—	—	—	—	Slow, thick, hoarse	Impaired, nothing in fundus	Impaired	—	—	—	Healthy	—	—	—
Yes	—	Intellectual fatigue	—	—	Disturbed by dreams	Thought she had a mask on her face, the head of a dog, &c.	Taste, smell, hearing, and sight	—	Yes; ideas of persecution; heard obscene remarks, insults, threats	—	Slow, thick, nasal	Visual acuity diminished	—	—	—	—	Hæmic bruit at base	—	—	—
Slight	Not remarkable	Mental processes weaker than formerly, not perverted	Deficient in power	No	Fair	No	No	Deficient	No	—	Slow and thick	Weak and blurred	Good	Weak	Normal	Pale	Weak	About normal	Partial passive congestion	Injected in parts	Respirations short and feeble
Yes	—	Answers well	—	—	—	—	—	—	—	—	Slow, guttural	—	A little impaired	—	Impaired	Red cells diminished (3,720,000 cubic cent.); hæmoglobin diminished (84 p.c.)	A little enlarged	Temporal and radial arteries a little thickened	—	—	—
Rather slow, variable	No	Perfectly intelligent	—	No	Good	No	No	Very fair	No	—	Groff, nasal, monotonous	—	—	—	—	Not examined, slight purpura on arms	Sounds normal, weak action	Apparently normal	Apparently normal	No marked congestion, except of lips and hands	Normal
Interval before answering questions	No	Shrewd woman	—	Present, variable	Usually good	No	No	Apparently good	None	Present (i. e. avoided crowded streets and places)	Slow, monotonous, nasal	Nothing abnormal	Nothing abnormal	Nothing abnormal	Nothing abnormal	Not examined	Sounds normal, slow action	Soft, slow pulse	None varicose	Congested on cheeks and lips	Normal
Moderately slow	No	Good intelligence	—	None	Good	None	None	Good	None	None	Slow, monotonous, not nasal	Normal	Normal	Normal	Normal	Not examined	Sounds normal, slow action	Apparently normal, slow pulse	Normal	Congestion of nose, cheek, and lips	Normal
No	No	Perfection	No change	No	Disturbed, has sensations of heat	No	No	Nothing abnormal	No	No	Nothing abnormal	Nothing abnormal	—	—	—	—	Sounds a little indistinct	Nothing abnormal	Nothing abnormal	Dilated on face	Sibilant râles at bases
Sluggish	—	—	—	—	Drowsy	—	—	Impaired	—	—	Slow, halting, difficult	Much impaired	Much impaired	—	—	—	Action very feeble	—	—	—	—

	Circulatory system.					Respiratory system.	Digestive system.						Lymph. glands.	Urinary system.							Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information.	No.
	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defæcation.		General state of urine.	Quantity.	Specific gravity.	Reaction.	Albumen.	Urea.	Colour.	Micturition.								
Very defective	—	—	—	—	—	—	Some difficulty in swallowing	Nearly all gone	Normal	Large and flabby	Great relaxation.	Bowels confined	Enlarged all over body	—	2 to 3 pints	1008 to 1012	Alkaline	Occasional trace	Diminished	Pale	Too frequent	—	—	Emphysema of lungs, aortic disease	Gradual increasing debility	Coma	Dropsy rather increased	Blistering the back of neck was of use	Patient never had any serious illness, but was always delicate and ailing. (‘Brit. Med. Journ.,’ Feb. 9th, 1884.)	1
Good	—	Normal, but sounds somewhat feeble	Pulse 68, feeble	Not distended	Defined flush on cheeks and nose; no sudden flushes; redness of hands; pallor round eyes and mouth	Slight temporary catarrh at one time	Normal	Back teeth gone, broken away in small pieces; front teeth good	Vascular and hypertrophied, bleed freely; mouth full of blood when she awakens	Large, clean, moist	Swollen, dirty grey in place of pink	Bowels confined	Not enlarged	Thick, curdy deposit of urates; no sugar	From 600 to 900 c.c.; average about 700 c.c.	1015 to 1025; average about 1018	Acid	None	1·8 per cent., with an average excretion of 11 grms. on a diet of 9 oz. bread, 8 oz. potatoes, 4 oz. meat, 10 oz. milk	Amber, when clear	Natural, except for occasional smarting	Apparently normal	Varies much; when urine is scanty she feels cold and weak; menstruation has no effect on her disease	None	—	—	—	Tonics (iron, arsenic, nux vomica), and quinine, with no change; under Tinct. Jaborandi, 3ss t. d. s., felt much better, but very little objective change	In good health until 17, when, after extraction of a tooth, had bleeding for 24 hours. A week later she noticed a “fulness in the throat,” and her speech was slow and thick. This passed away, but she had the same choking feeling when her eyelids became swollen 9 years ago. No epistaxis or hæmorrhoids, but loses much blood when she cuts herself. (‘Clin. Soc. Trans.,’ vol. xvii.)	2
—	—	Healthy	—	—	—	—	—	Has lost all his teeth	—	Large	—	—	—	No sugar	—	—	—	None	—	—	—	—	—	Stationary	—	—	—	Much salivation. (‘Progrès Méd.,’ July, 1880.)	3
—	—	Humic bruit at base	—	—	—	—	Difficult from swelling of mucous membrane of mouth	Good	—	—	Uvula swollen	Habitual constipation, with occasional purging	Enlarged cervical glands in childhood	Deposit of mucus	Normal	1013 to 1020	Slightly alkaline	None	Diminished, 14 grms. in 24 hours	—	—	—	—	Great improvement	—	—	Anti-syphilitic treatment without effect; iron, quinine, sulphur baths later with great benefit. Mental symptoms quite disappeared, and eczema was scarcely marked	The swellings in the position of the parotid glands. The author draws attention to the fact that the mental symptoms disappeared simultaneously with the diminution in the general swelling. (‘Arch. de Neurol.,’ Nos. 7 and 8, 1882.)	4
Normal	Pale	Weak	About normal	Partial passive congestion	Injected in parts	Respirations short and feeble	Normal	Very bad	Very bad	Large and flabby	Normal	Normal	Normal	—	Varies	About 1010	Acid	None	—	Pale	—	Normal	—	None	Better now than for 3 years	—	—	Vapour baths appeared to do good; jaborandi did not agree	In St. George’s Hospital for many months under Dr. Whipham. Rheumatic fever at 19. (Unpublished.)	5
Impaired	Red cells diminished (3,720,000 cubic cent.); hæmoglobin diminished (84 p.c.)	A little enlarged	Temporal and radial arteries a little thickened	—	—	—	—	Broken, irregular, deficient in upper jaw	Swollen and bleeding	—	Pale and swollen	Constipation	Inguinal a little swollen	—	Normal	1015	Acid	—	Diminished	Pale	Normal	—	—	—	—	—	—	In a piece of skin taken from the forehead, the fibrillar connective tissue was found microscopically to be transformed into a tissue of myxomatous structure. The patient had had acute rheumatism at the age of 33. Case reported by Dr. Seppilli. (‘Italia Medica,’ Sept. and Oct., 1883.)	6
—	Not examined, slight purpura on arms	Sounds normal, weak action	Apparently normal	Apparently normal	No marked congestion, except of lips and hands	Normal	Normal	Much decayed	Normal	Swollen	Considerably swollen	Much constipation, otherwise normal	—	—	Diminished, often only 20 oz. in 24 hours	1010 to 1017	Usually acid, once alkaline	None	Noted once only, 8 grms. in 24 hours	Rather light	Very frequent, nocturn. incontinence	—	None	None	No change, great weakness, slight purpura on arms	—	—	Tonics and change of air; no effect	Slight right hemiplegia and aphasia at 61, and transient left hemiplegia at 62. (Unpublished.)	7
Nothing abnormal	Not examined	Sounds normal, slow action	Soft, slow pulse	None varicose	Congested on cheeks and lips	Normal	Slow, otherwise normal	Considerably decayed	Normal	Swollen	Moderately swollen	Constipation, otherwise normal	Not abnormal	Scanty mucus	About 20 oz. in 24 hours	Average 1018	Acid	None	—	Normal	No difficulty	—	Occasional sudden vertigo and vomiting, with mental depression	None	Slight improvement	—	—	Tonics, chiefly strychnia; probably no effect	(‘Clin. Soc. Trans.,’ vol. xv, p. 87.)	8
Normal	Not examined	Sounds normal, slow action	Apparently normal, slow pulse	Normal	Congestion of nose, cheek, and lips	Normal	Normal	Good	Good	Large and swollen	Trifling œdeme	Normal	—	Clouded with mucus	Normal	1020	Acid	An occasional trace, usually none	Not estimated	Normal	Normal	—	None	None	Pregnancy after leaving hospital, full term; child healthy, but temporary, diminution of myxœdematous condition	—	—	Tonics; apparently no effect	(‘Clin. Soc. Trans.,’ vol. xv, p. 90.)	9
—	—	Sounds a little indistinct	Nothing abnormal	Nothing abnormal	Dilated on face	Sibilant rales at bases	Nothing abnormal	Nothing abnormal	Nothing abnormal	Nothing abnormal	Nothing abnormal	Nothing abnormal	Nothing abnormal	—	Not measured	—	—	None	Not estimated	—	—	—	—	—	Stationary	—	—	Cold baths, arsenic, iodide of potassium, without effect	(‘Progrès Méd.,’ No. 5, 1882.)	10
—	—	Action very feeble	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Rapid wasting	Iron, wine, good diet; no improvement	Case reported from memory. Short account in ‘Brit. Med. Journ.,’ April 7th, 1883.	11

No.	Observer's name.	Initials of patient	Age.	Sex.	Social condition.	Family antecedents.	Personal antecedents.								Bulk.	Weight.	Physiognomy.	State of skin.					Nails.	Hair.	State of thyroid, past and present.	Temperature.			Presence of watery dropsy (pitting, ascites).	Sensation.				Subjective sensations.	Other symptoms.
							Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.				Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.				Axillary.	Of surface.	Of internal parts.		Lost.	Perverted.	Delayed.	Of heat and cold.		
12	Cobbold	S. L.	50	F.	Widow, washer-woman	Father died of phthisis, mother of cholera	—	—	Probably yes. Husband's death	—	—	8, 2 sons only survive	35	—	—	—	—	Cretin-like	Alæ nasi and eyelids thick and puffy; lips thick	Harsh, dry, dull brown tint	—	—	Hands fat, puffy, but no œdema	—	Scanty on head	—	—	—	—	—	—	—	—	—	—	—
13	Copland	—	34	F.	Widow, hospital patient	Mother died of phthisis; 1 brother and 1 sister have phthisis	No	No	—	Regular	4	4, all died of phthisis	32¾	Face	London all her life	Moderately nourished	—	Broad features, heavy expression	Œdematous looking; lips thick; marked vascularity on cheeks	Natural	Some fulness	—	Dry and harsh	Striated	Thin	Outline cannot be determined	Subnormal, about 97·8°	—	—	None	—	No	Somewhat	—	Severe frontal headache	No
14	Coxwell	—	18	F.	Inferior	Father has fits after injury to head; insanity in an uncle and aunt	Sniffles when a child	—	Yes, before illness commenced	Not appeared	—	—	8½	Face	South London	Small, abdomen large	4 st. 6 lbs.	Sad, rather fatuous	Transparent pallor; injected capillaries on cheeks; furrows obliterated	Thickened	Nothing abnormal	Said not to be abnormal by a good nurse	Blue, very cold	Nothing marked	Nothing marked	Very small, if felt at all	a.m. 95·6°, p.m. 97°	—	—	—	—	Not markedly	Not markedly	Sensation of cold diminished	—	—
15	Donkin	S. F.	46	F.	Married	—	No	No	No	—	—	—	—	Belly, then hands and feet	—	—	—	—	Œdematous	—	—	—	Feet swollen	—	—	—	Normal (several observations)	—	—	—	—	—	—	—	—	—	—
16	Donkin	Mrs. A.	38	F.	Home work	Father died of heart disease at 57, mother of phthisis at 47, maternal grandfather of phthisis; 1 brother insane from sunstroke	—	—	— has lost a little every week	Regular every 3 weeks, lasting 7 days, profuse; for last 3 weeks	Last pregnancy 7 mos. ago, since when symptoms of myxœdema appeared	11, 8 alive; none born since onset of myxœdema	37½, six months before date of observation	Hands, then face and finally legs	Limehouse, London	Stout	12 st. 11 lbs.	Placid, and heavy	Cool, clammy, waxy	Warm, perspiring	Smooth; creases of skin lost; warm, perspiring	—	Feet cool	Have always been brittle	Dark brown, falling a little, but not especially within last 7 months	Apparently quite normal; previous condition not known	97·6°; never over 98°, often below 97°; twice 96°	? 97·6°	In vagina 98·4°, in rectum 98·6°; more evident ago; no ascites	Slight pitting over dorsum of left foot and over chest, 8 weeks	No	No	No	—	Occasional tingling in fingers	Slight œdema ankles
17	Duckworth	A. M.	46	F.	Hawker, very poor, carries great weights on the head	—	—	—	—	—	—	7	? 43	—	32 years in England; born in Kerry	Large, obese woman	—	Face bloated	Morella cherry-red patches of vascularity over malar bones; lips heavy and dusky red, blubbery; puffy under eyelids; ears waxy; moles on chin and face	Integuments waxy where not injected	Fatty cushions felt over each	—	Very rough and dry on hands and forearms; legs pigmented from exposure to fire; patches like raised purpura on backs of hands and wrists	Striated	Dark	Not to be felt	—	—	—	Legs pit on pressure	—	—	—	Complains of feeling cold	—	—
18	Duckworth	E. M.	50	F.	—	Mother died at 62 of heart disease; father after rupture of blood-vessel	Doubtful	—	Ill-used by husband	Ceased 3 years ago	9 children and several miscarriages	9	43 or 44	Face, hands, and feet, about the same time	Birmingham; London for 25 years	Has always been stout	13 st. 2 lbs.	Stolid, without vivacity; semi-translucent; lower lid drooping; nose flattened; lips full, pendulous, puffy; some moles	Swollen and waxy, red patch on cheeks and nose; eyelids puffy,	Swollen, puffy, harsh, rough	More fat than usual, especially on right side	—	Swollen; hands large and expressionless, skin on backs rough and very cold	—	Very dry and becoming thin, light red	Small	95° to 99·4° on right side, mean 97°; 98° average on left side, lowest 93·4°; only once above normal; usually a difference of 1° or 2° between the two sides	—	—	Pitting of eyelids and legs on long pressure	Anæsthesia of right leg 7 years ago (?) after a stroke	—	—	—	Of cold, especially in right foot, shooting pains in lumbar and iliac regions; offensive smells and tastes	—
19	Duckworth	S. H.	37	F.	—	—	—	—	—	—	—	8	—	Face	—	Very obese	—	Stolid	Malar vascularity, sallow; moles on forehead & cheek	—	—	—	Rough on back of hands	—	—	—	—	—	—	Slight œdema of feet	—	—	—	—	Of cold; frontal headache	—
20	Duckworth	S. M.	40	F.	Lower classes	Father paraplegic, died of "asthma;" mother alive and well; father's mother died of dropsy	—	—	—	—	Pregnant when last seen	Children healthy, except youngest, who is rickety	—	Eyelids	—	—	12 st. 6 lbs., but lost 2 st. in 18 months	Stolid, immoveable, listless	Waxy, sallow, a little colour on cheeks, several moles; eyelids puffy and œdematous looking; pigmentation on forehead; 26 moles on face	—	Some fulness	—	Hands puffy on the backs	—	Hair on scalp thin; eyelashes and eyebrows becoming sparse	—	—	—	—	—	Puffiness under eyelids varies	No	No	No	—	Hands feel dead and tingle	—
21	Duckworth	F. M. S.	46	F.	Dressmaker, married 16 years	Father dead; mother healthy at 74; 1 brother and 2 sisters healthy	—	—	No	Regular, scanty; ceased 1 year ago	1	1 died, æt. 6 months	35 (?)	Right foot	Native of Retford; in London for 20 years	—	—	Like that of chronic nephritis, dull and languid	Dirty, sallow; flush on malar bones; puffy about eyes; mole on left cheek	Abdomen full	No cushions of fat	—	Hands expressionless, skin harsh on backs; hands and legs swollen, the latter œdematous	Great hypertrophy of great toe	Scanty, partially bald	Not enlarged	97·2°, 97·4°, and 98·2°	—	—	Yes, of legs	—	—	Less than a second between touch on hand or foot and response	—	Always feels cold, nasty taste in mouth	No

TABULATED CASES OF MYXŒDEMA—*Cont*^{d}.

Of heat and cold.	Subjective sensations.	Occipital headache.	Motion.				Convulsions.	Reflexes.		Intellectual changes.															Circulatory system.					Respiratory system.	Deglutition.
			Paralysis.	Paresis.	Retardation.	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia.	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		
—	—	—	No	Gait very feeble	—	—	—	—	—	Torpid, dull, lethargic	—	—	—	—	—	—	Yes, imagined she was persecuted	—	Melancholy and partially demented; suicidal	—	Voice went entirely after a time	Pupils dilated	Very deaf	—	—	—	Sounds feeble, but normal	Pulse 32 before death	—	—	—	Difficult
—	Severe frontal headache	No	No	No	In motion	No	No	Natural	Natural	Slight	No	Perfect, but slow	—	No	Fairly good	None	None	Fair, but not so good as formerly	No	No	Slow, but articulation good	Good	Good	Good	Not impaired	—	Dulness normal; 1st sound dull and muffled at apex, inaudible at base; 2nd accentuated at base and apex	Healthy	Healthy	Healthy	Healthy	Choking sensation in swallowing for a year
Sensation of cold diminished	—	—	Unable to walk finally	Of all the limbs, of face, of tongue, and probably of muscles of deglutition	—	—	—	Well marked in lower extremities and equal	Equal and perhaps a little excessive in lower extremities	Marked	Would spend hours in tearing up newspapers and playing with beads	Intelligence only equal to a child of 4	Lost	Often great	Often disturbed	—	—	Probably very much impaired	An attack simulating mania whilst under observation	—	Extremely indistinct, finally lost	Good	Good	Good	Good	—	Sounds feeble, but otherwise healthy	Normal, pulse 96, regular, very feeble	Normal	—	Normal	Difficult
—	—	—	—	—	Walks slowly	—	—	—	—	Stupid and confused for 2½ years	—	—	—	Yes	Drowsy; sleeps well at night	—	—	Getting worse	—	—	Talks in a drawling dreary way	—	—	—	—	—	No bruit	—	—	—	—	—
—	Occasional tingling in fingers	Slight occasionally	None	None	None	None	None	Present and equal	Patellar reflex present and equal; no ankle-clonus	Not remarkable now, but at first some difficulty in thinking	None	Mental processes fairly performed	Good	Upset by the slightest thing	Disturbed by unpleasant dreams; nightmare; often very drowsy	None	Often imagines she sees people between waking and sleeping	Very bad for recent events. Forgets what she has gone into a shop for	No	Says she is very nervous when out	None; at first she says her speech was drawling	Left lens hazy. Retime and discs normal	Good	Good	Good	Good supply of red corpuscles. No increase in white, except after a meal	Normal	Normal, soft	No marked enlargement	Well marked on cheeks	Good	Good
Consciousness of feeling cold	—	—	—	Progressive	—	—	Yes, 10 years ago	—	—	Well marked	—	—	(Uneducated)	—	Wakes at 3 a.m. and sleeps no more (from early habit perhaps)	—	—	—	Probably mania; was shut up for 6 months	—	Thick, slow, and indistinct	—	—	—	—	—	Sounds natural	—	—	Distended over malar bones	Bronchitis, slight congestion and defective tension of vocal cords	—
—	Of cold, especially in right foot; shooting pains in lumbar and iliac regions; offensive smells and tastes	—	Of right leg 7 years ago (?) from a stroke	—	Yes; takes 1½ hour to dress	Occasional falls	—	Plantar lost on right side	—	Yes	—	—	—	—	Sleeps a great deal and soundly	—	—	—	—	Very marked, dares not cross a street alone	Slow, harsh, snuffling	Eyes bluish grey; conjunctivæ slightly œdematous	—	—	—	—	Action feeble	Radial somewhat thickened; pulse 48 to 88	—	Dilated on cheeks	—	—
—	Of cold; frontal headache	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow	—	—	—	—	—	Sounds clear	Pulse 75	—	—	—	—
—	Hands feel dead and tingle	—	—	—	Yes	Occasional staggering	—	—	Knee-jerk absent	—	—	—	—	Yes	Sleeps well at night, drowsy in the day	—	—	Forgetful	—	—	Thick, slow, snuffling	—	—	—	—	—	Natural	Low tension, tracing given	—	—	—	—
—	Always feels cold; nasty taste in mouth	No	—	Difficulty in turning in bed	Yes	—	No	Present	Knee-jerk not strong	Marked	—	—	(Specimen given)	—	Good	—	—	Worse during last 12 months	No	For theatres, not for churches	Slow drawling	Not so good as formerly	Defective, more on right side	Good	—	? Slight diminution in red corpuscles, marked increase in white	Normal	Tracings given, pulse 80	—	Dilated on cheeks	Bronchitis	Natural

		Circulatory system.					Respiratory system.	Digestive system						Lymph glands.	Urinary system.								Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information.	No
Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defecation.		General state of urine.	Quantity.	Specific gravity.	Re-action.	Albu-men.	Urea.	Colour.	Micturition.									
—	—	—	Sounds feeble, but normal	Pulse 32 before death	—	—	—	Difficult	—	—	—	Fauces swollen	Very constipated	—	—	Small	—	—	—	—	—	—	—	—	—	Progressively worse	Collapse	—	—	From Dr. Ord's notes. (Unpublished.)	12
Good	Not impaired	— and muffled at base; 2nd accentuated at base and apex	Dulness normal; 1st sound dull at apex, inaudible at base; 2nd sound at apex	Healthy	Healthy	Healthy	Healthy	Choking sensation in swallowing for a year	Fairly good	Healthy	Healthy	Healthy	Constipation — or two glandulæ conglutinatæ	Normal with exception of one	Clear deposit of mucus	Normal	1025	Acid	None	—	Straw	Normal	—	—	None	Improvement	—	—	Alkalies and gentian; some improvment under jaborandi	(Unpublished.)	13
Good	Good	—	Sounds feeble, but otherwise healthy	Normal, pulse 96, regular, very feeble	Normal	—	Normal	Difficult	Very bad, irregular, not syphilitic	Rather sore	Semi-paralysed	—	Diarrhœa sometimes; loss of control over bladder and rectum	Not enlarged	—	Difficult to ascertain; on 3 successive occasions, 6, 7½, and 8 ounces	1010 to 1035	Acid	—	134, 138, 140 grains on three occasions	Pale	—	No sign of puberty	—	—	Worse when last seen	—	—	Tonic and palliative; little effect	Before the age of 8½ the child went to school, could read the Bible "as well as her mother," and learnt arithmetic, of which she retained, when seen, slight knowledge. Drs. Ord and Barlow were both inclined to consider it a case of myxœdema. ('Clin. Soc. Trans.,' vol. xvi.)	14
—	—	—	No bruit	—	—	—	—	—	—	—	—	—	Constipation	—	—	—	—	—	None	—	—	—	—	—	—	—	—	—	—	(Unpublished.)	15
Good	Good	Good supply of red corpuscles. No increase in white, except after a meal	Normal	Normal, soft	No marked enlargement	Well marked on cheeks	Good	Good	3 extracted for decay, the rest very good	Normal	Normal	Normal	Bowels generally regular; constipation for a few days occasionally; no diarrhœa	Not enlarged	—	1½ to 3 pints daily	Average 1021	Acid	None; repeated examinations	2·1 to 3·9 per cent.; daily examination for a week	Normal	Normal	—	—	None	—	—	—	Improvement apparently due to rest and tonics	Muscles of arms and legs responded quickly to faradism. Galvanism: 30 cells, arms equal 5½, legs 3; 20 cells, arms equal 2½, legs ½. (Unpublished.)	16
—	—	—	Sounds natural	—	—	Distended over malar bones	Bronchitis, slight congestion and defective tension of vocal cords	—	Lost many	—	Sluggish in movement, very large	Natural	—	—	No sugar	—	1009 to 1015	Acid	None	—	—	—	—	—	Bronchitis, ? purpura	—	—	—	Ol. morrhuæ, arsenic	Erysipelas of right hand and arm 9 years ago. Pain in back for 3 years. Gout 28 years ago. Fits 10 years ago. Vertigo often at night. Fainting fit lately. Disposed to be cheery and bright, and seeming to struggle with her defects. ('Clin. Soc. Trans.,' vol. xiv.)	17
—	—	—	Action feeble	Radial somewhat thickened; pulse 48 to 88	—	Dilated on cheeks	—	—	Good and strong	—	Large	Swollen	Constipation	—	No sugar	Scanty of late	1015 to 1022	Acid	Found once in 3 years	—	—	Slight dysuria	—	—	Bronchitis	—	—	—	Arsenic and good diet without obvious benefit	Facial erysipelas and some liver affection 12 years ago. Partial paralysis and anæsthesia of right leg 7 years ago. Some wasting of right leg. Muscles responded well to both currents. Is getting thinner, 4 inches less round the waist than a year or two ago. (See 'Clin. Soc. Trans.,' vol. xiv.)	18
—	—	—	Sounds clear	Pulse 75	—	—	—	—	—	—	—	—	—	—	—	—	1005 to 1010	Acid	None	—	—	—	—	—	—	—	—	—	—	(Unpublished.)	19
—	—	—	Natural	Low tension tracing given	—	—	—	—	—	—	Clean, natural	—	Constipation	—	No glucose	—	1010 to 1016	—	None	—	—	—	—	—	Apparently becoming worse	—	—	Ol. morrhuæ, arsenic, and jaborandi	('Clin. Soc. Trans.,' vol. xiii.)	20
Good	—	? Slight diminution in red corpuscles, marked increase in white	Normal	Tracings given, pulse 80	—	Dilated on cheeks	Bronchitis	Natural	Nearly all gone	—	Natural	Natural	Constipation	No enlargement	Phosphates on boiling, no sugar or peptones	—	1010 to 1013	Neutral or acid	None	—	—	—	—	—	Bronchitis	Increasing difficulty of locomotion	—	—	—	Scratches take long to heal. ('Clin. Soc. Trans.,' vol. xiv.)	21

No.	Observer's name.	Initials of patient	Age	Sex	Personal antecedents. Social condition.	Family antecedents.	Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.	Bulk.	Weight.	State of skin. Physiognomy.	Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.	Nails.	Hair.	State of thyroid, past and present.	Temperature. Axillary.	Of surface.	Of internal parts.	Presence of watery dropsy (pitting, ascites).	Sensation. Lost.	Perverted.	Delayed	Of heat and cold.	Subjective sensations	Occipital headache.
22	Drewitt	Mrs. S.	45	F.	—	—	—	—	Yes	—	—	—	33	—	—	Stout and heavy	Has increased 2 st. in 4 years	—	Swollen and round; sallow, translucent, wax-like skin; broad nose, purple lips, dusky red patch on cheeks, eyelids pendulous and transparent	Swollen; never perspires	—	Scaly	Hands thick, swollen, spade like; wedding ring being embedded in finger had to be cut out	—	Eyebrows disappearing	—	95°	—	—	No pitting	—	—	—	—	Always cold	—
23	Edmunds	—	45	F.	Confidential domestic servant; single	Father died of dropsy and heart disease. Mother alive, æt. 78	No	No	No	Absent 6 months	None	None	About 40	Feet	Suckley, Worcestershire	Good condition	9 st. 4 lbs.	—	Dry, not rough; dull swelling under eyes; lips thick	Dry, not rough	Dry, not rough	—	Dry, rough, and harsh; hands misshapen; fingers thick	Normal	Falling out	No apparent abnormality	96° and 97°	90·8°	98·4°	None	No	No	No	Good	Numbness in left hand. Bad tastes and smells	No
24	Feau	B. B.	47	M.	Cabdriver	Father and mother both died, æt. 74. The latter had bad health, and suffered from bronchitis. No consanguinity; 2 sisters died in infancy; 1 brother, one of twins, æt. 42, alive and healthy	No	No	No	—	—	—	41	Face and hands	Richmond, London	5 ft. 3½ in.; thick set	—	Expression vacant; round flat face	Waxy-yellowish tint; patch of pink vessels on each cheek; eyelids boggy; scalp dry, thick, and leathery; small eyes, thickened lips and alæ nasi	Scaly and shining; no perspiration	Soft, swollen	—	Upper extremities swollen, livid, wrinkled; no pitting; fingers flattened, hollowed, deeply marked longitudinally. Lower extremities swollen, thickened; skin peels off in large waxy flakes. Feet thickened and twisted	—	Thin and dry	Not recognisable	95° F.	—	—	None	—	—	—	Exaggerated	—	Frequent, dull, and aching
25	Fournier	Mrs. X.	58	F.	—	Father died at 58 of apoplexy, mother alive at 80	—	—	—	Began at 13; ceased at 40	—	3, two alive	—	—	Brest, France	—	—	Dull, expressionless, mask-like drooping; rose tint on cheeks; nose thick; lips large, livid; mouth slit-like	Forehead much wrinkled; upper eyelids swollen, translucent,	Not abnormal	—	—	Hands and forearms swollen; much swelling of feet and legs. Skin dry, rough, scaly; no sweating	Stunted and liable to break	Quite gone from body; very scanty on scalp	—	(Highest 98·6°, often 97·6°; average 97·8° (many observations)	In hand never above 81·6°, lowest 77·9°; average 79·7°	—	Slight pitting of legs	No	No	No	—	Numbness of fingers; sensation of cold	—
26	Fraser	—	44	M.	Poor	Father died at 50 of cause unknown, mother at 66 of chronic chest disease	Doubtful	At times	—	—	—	—	37	Face	Paisley	Heavy, large boned	180 lbs.	Dull and apathetic	Clear, translucent, swollen, not pitting; red patch on cheeks	Swollen	—	—	Swollen, pink-like, cold, blue	Blue	Brown; not specially affected	Past not known; at present left lobe not felt; right the size of a large almond	Subnormal; 97½°	—	Not taken	Pitting of legs	?	?	?	?	?	No
27	Goodhart	—	48	F.	Charwoman, and probably a prostitute before marriage; washerwoman afterwards	Father and mother dead; cause unknown	Yes	Yes	—	Regular	Doubtful	None	13 or 14	Legs	London	Very bulky	—	Expression placid and fatuous; face large and moon-shaped; nose small and broad, but little elevated from face	Fine, dry, smooth, flushed cheeks, with injected capillaries of nose bright red; lips thick; eyes appear small owing to œdema of lids; head bullet shaped; forehead narrow and retreating	Fine, scaly, dry, a little rough	Like that of body; no fat pads	—	Backs of hands and arms rough, dry, harsh, scaly; legs ditto	—	On head fine, dark, curling, short, not abundant; not sparse in front	—	Below normal; 96·8° on admission	—	97·4°	Pitting of legs	No	No	No	Feels heat better than cold when applied to arm	Not marked	Present occasionally; dull aching
28	Goodhart	—	46	M.	Lighterman	Father asthmatic; 2 brothers died of diabetes	—	No	—	—	—	—	42	—	—	—	—	Cretin-like	Œdematous	Thick swelling, more resistant and elastic than ordinary œdema	—	—	—	—	—	—	—	—	—	None	—	—	—	—	—	—
29	Gowans	—	52	F.	Small grocer	Father died at 84, mother at 70	No	No	—	Ceased 10 years ago; profuse for some months previously	10, including 2 abortions	8; none born after establishment of myxœdema	51	Face	South Shields	Large	About 12 st.	Characteristic (photograph sent)	Wrinkled, loose, transparent-looking, red patches on cheeks	As dry and rough as sand-paper	Dry and rough	Dry and rough	Dry and rough	—	Nearly all off head	Cannot be felt	94·5°	—	—	No	On hands	—	—	—	"Trouble at top of head"	—
30	Gray	—	52	F.	Spinster lady	Nearly all her father's relations died of heart disease or apoplexy; mother's relations subject to rheumatic gout	—	—	—	Regular until 4 years ago, when ceased	—	—	46	Face, particularly eyelids	Ireland	Large	11 st. 7 lbs.	Features broad, heavy; weary look	Eyelids puffed and translucent; cheeks reddish, glazed and swollen	Firm, appears stretched; more natural than on face	Natural	Natural	Limbs thick and hard	Convex, with longitudinal grooves	Grey, and latterly falling out	No enlargement	97°	—	98°	No ascites, slight pitting of both ankles	—	—	Yes	More sensitive to cold than heat	—	None
31	Grocco	—	45	F.	In poor circumstances	—	—	—	—	Profuse, painless	4, one being a miscarriage	3; none born since myxœdema began	33	All over the body	Damp locality	Increased, appears dropsical	—	Swollen, expressionless	Swollen, dry; eyelids puffy	Swollen, dry; much fat	—	—	Misshapen and swollen, especially hands and feet	—	Bald patches; almost absent on pubes	Right lobe hypertrophied	32·2° to 36·4° C. (97·1° to 97·5° F.)	—	—	—	—	—	—	—	—
32	Gross	—	48	F.	Machinist (sewing)	Father died of heart disease; mother died, æt. 43, "had tumours in her inside;" 11 brothers and sisters died young; 4 others always ailing	No	Very little	—	—	3	2; 1 alive æt. 20, always ailing; 1 only lived 9 days; none born since establishment of myxœdema	About 37	Feet and legs	London all her life	Stout	About 11½ st.	Heavy	Dry, rose flush on each cheek	Abdomen dry and light brown; brown patches on back and neck	—	—	Brown patches on arms; legs fair and white, but dry	Nails of right hand and some of toenails grooved transversely	Auburn when young, now dark brown; crispy and coming off	Normal	—	—	—	None	No	No	On right side	—	Tingling and aching pain, usually at night, starting from tips of fingers of right hand and extending upwards	Occasionally

TABULATED CASES OF MYXŒDEMA—*cont.*

n.				Motion.				Convulsions.	Reflexes.		Intellectual changes.													Circulatory system					Respiratory system.		
ayed.	Of heat and cold.	Subjective sensations.	Occipital headache.	Paralysis.	Paresis.	Retardation.	Incoordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia.	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	T
—	—	Always cold	—	—	Movements feeble	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	Is afraid of going about alone lest she should be run over	Slow, deliberate, indistinct	—	Partially lost	—	Partially lost	—	Sounds feeble; no murmur	Pulse 76, feeble	—	Dilated on cheeks	—	—	
No	Good	Numbness in left hand. Bad tastes and smells	No	No	No	Considerable	No	No	—	Perhaps exaggerated	Considerable	—	Some imperfection	Slower than formerly	No	Variable	No	No	Defective	No	No	Slow, laboured	Vision good	Chronic ear disease; deaf	Good	Good	—	Normal	Normal	Normal	Dilated on cheeks	Good	Good	
—	Exaggerated	—	Frequent, dull, and aching	—	Says a cold would knock her down	Walks very slowly	At times totters, especially in cold weather	—	—	—	Marked	In thought; has become proxy	—	Good	Decided	Fair	—	—	Good for past, bad for recent events	—	Decided	Thick, hoarse, nasal	Misty, uncertain	Imperfect	No marked change	Def ective	—	Normal	No perceptible change	—	—	Breathing shurt; no lung affection	Seems as if he must bolt his food	W serv an
No	—	Numbness of fingers; sensation of cold	—	— head drooping on sternum; arms weak	Muscles of front of neck weak;	Gait slow, processional	Frequent false steps; 3 falls	—	—	—	—	No	Perfection	Slow	—	Dreadful dreams and nightmares	—	No	Good	—	—	Slow, drawling, harsh monotonous	Sight good; much watering of eyes	—	—	—	Normal colour, and form of cells natural	Normal	Radial regular, compressible	—	—	—	Some difficulty	De h fr
?	?	?	No	No	No	No	No	No	—	Normal at present	Very marked	No	Marked apathy	Illiterate	—	Fairly good	Could not be determined	Could not be determined	Could not be determined	Yes	No	Slow and whispered	Normal	Normal	Normal	—	—	Normal	No marked change	—	Dilated on cheeks	Pleurisy in early period	—	
To	Feels brat better than cold when applied to arm	Not marked	Present occasionally; dull aching	No	No	—	—	No	—	Patellar, reflex, and front-tap contraction present on both sides	—	Not present	—	Cannot write	No, placid	Good, snores much	None	None	Rather good for recent events	—	—	Slow, thick, hoarse, croaking	Good	Bad at times; varies much	Not tested	Good	48·8 red cells per square as tested by hæmacytometer	Normal	Normal	Normal	Normal	A little bronchitis; otherwise normal	Normal	
—	—	—	—	—	—	—	—	—	—	—	Much	—	—	—	—	Drowsy	—	—	Bad	—	—	Thick and deliberate	—	—	—	—	—	Large	Thick; pulse tracing of high tension	Venous congestion of face	—	—	—	
—	—	"Trouble at top of head"	—	No	No	—	Gait awkward and staggering	No	— and perhaps somewhat exaggerated	Knee-jerk not delayed,	Answers questions intelligently, but in a slow and ponderous manner	Very loquacious when once started	—	—	Excessive	Sleeps too soundly, and apt to fall asleep at any time	—	—	Very bad	—	Rather opposite condition	Slow, difficult, interrupted by frequent efforts of deglutition	Bad	Normal	—	—	Want of coagulatory power; nearly bled to death from extraction of a tooth	Normal	Normal	Normal	Injected on cheeks	Normal	Fair	
ce	More sensitive to cold than heat	—	None	—	—	Movements slow and deliberate	—	—	Natural but slow	—	Well marked	—	—	Can write well, but very slowly	Yes — noises and sounds of voices; natural afterwards	Early sleep disturbed by fancied	—	—	Not good	—	— too large, bad not under control	Slow, and speaks as if tongue were and as if she proper control over it	—	Good	Good	Natural	—	Sounds weak, but no bruit	Natural	—	Filled on face and neck	—	Has to direct her attention to the act, as she is afraid of choking	
-	—	—	—	—	—	Yes	—	—	—	—	Yes	—	—	—	Momentary for slight causes	—	—	—	Impaired	—	—	Voice hoarse	Visual acuity diminished	Impaired	—	Impaired	—	Enlarged, sounds feeble, palpitation	—	—	—	—	Sometimes painful	
ight le	—	Tingling and aching pain, mainly at night, starting from tips of fingers of right hand and extending upwards	Occasionally	No	Slight in left arm	No	Can do needle-work	None	Diminished	Normal	Ideas slow	No	Fairly intelligent — are numb, and she cannot feel the pen distinctly	Cannot write much, as fingers	No	Always sleepy	No	No	Good	No	—	Slow, drawling, as though tongue moved badly	Good, but at times sees flashes	Good	Good, but less acute than formerly	Sometimes loses it for days together	—	Slight systolic aortic bruit	? Normal; pulse 72, regular	Normal	—	Respirations 15 a minute; slight chronic bronchitis	Sometimes very difficult, and has to spit out food	S

		Circulatory system.					Respiratory system.	Digestive system.					Lymph glands.	Urinary system.							Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information.	
Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defæcation.		General state of urine.	Quantity.	Specific gravity.	Re-action.	Albu-men.	Urea.	Colour.	Micturi-tion.								
—	Partially lost	—	Sounds feeble; no murmur	Pulse 76, feeble	—	Dilated on cheeks	—	—	—	—	Pale, swollen, smooth, tooth marked, too large for the mouth; cretinoid	Soft palate swollen and pale	Obstinate constipation	—	No sugar	—	1011	—	None	—	—	—	—	—	Menor-rhagia	Stationary	—	—	Strychnia and later jaborandi 3ij to 3iss h. d.; Slight improvement with small doses, but no perspiration. Ergot and iron for menorrhagia	('Clin. Soc. Trans.,' vol. xvii.)	22
Good	Good	—	Normal	Normal	Normal	Dilated on cheeks	Good	Good	Good	Good	Moist epidermis comes off in patches	Normal	Constipation	Normal	—	2 pints 7 oz. in 24 hours	1015	Neutral	None	207 grs. in 24 hours	Pale	Normal	Normal	None	None	—	—	—	(Unpublished.)	23
No marked change	Defective	—	Normal	No perceptible change	—	—	Breathing short; no lung affection	Seems as if he must bolt his food	Well preserved, short, and strong	Pale, bleed easily	Smooth, large, pink, clean	Uvula stiff and glistening	Difficult from want of expulsive power	—	—	Rather increased	1012	Acid	None	—	Pale straw	Slow	Desire lost	—	—	For 4 or 5 years there has been gradual decline in strength. Backs of hands less swollen	—	—	—	At 25 had rheumatic fever with persistent delirium. Appetite always good, and of late he has craved for food. The saliva dribbles out of the mouth, especially at night. (Unpublished.)	24
—	—	Normal colour, and form of cells natural	Normal	Radial regular, compressible	—	—	—	Some difficulty	Decayed, but have not fallen out	Swollen and ulcerated (? from neglect)	Not enlarged	Œdematous looking	Bowels open every two or three days	—	Clear, limpid	Usually about 750 c.c.	1015 to 1027	Acid	None	11 grms., 175 (average of 5 examinations)	Amber yellow	—	—	—	Stationary	—	—	Milk diet, tonic treatment, arsenic and quinine, without result	Much salivation. ('Gaz. Hebd.,' No. 4, 1882.)	25
Normal	—	—	Normal	No marked change	—	Dilated on cheeks	Pleurisy in early period	—	Good	—	—	—	—	—	—	36 to 66½ oz.	—	—	None	240 to 399 gr. per diem.	Straw coloured	—	—	Excessive perspiration	Pleurisy	Recovery after 2½ years accompanied by profuse perspiration, especially of face	—	—	Tonic and general	('Medical Times and Gazette,' October 15th, 1864.)	26
Not tested	Good	48·6 red cells per square as tested by hæmacytometer	Normal	Normal	Normal	Normal	A little bronchitis; otherwise normal	Normal	Good	Spongy	Large, red, painful, says it is too large for her mouth	Injected and painful; perforation probably syphilitic at junction of hard and soft palate	—	Sub-maxillary glands very large and painful	—	48 to 60 ounces	1016	Acid	None	Usually diminished 0·9 to 1·4 per cent.	Pale straw	Easy	—	—	Slight bronchitis	Stationary	—	—	Pot. iod. gr. v, t. d.; glyc. ac. borac. to fances	She attributes her condition to severe shock 5 years ago after her husband's brutal treatment. (Unpublished.)	27
—	—	—	Large	Thick; pulse tracing of high tension	Venous congestion of face	—	—	—	—	—	—	—	—	—	No casts	—	1020	—	None	—	—	—	—	—	—	Gradual, increasing slowness of mind	—	None	First symptoms were frontal headache and vertigo, then loss of memory and much drowsiness. Has had gout. ('Clin. Soc. Trans., vol. xv.)	28
—	—	Want of coagulatory power; nearly bled to death from extraction of a tooth	Normal	Normal	Normal	Injected on cheeks	Normal	Fair	—	—	Swollen	—	—	—	—	Normal	—	—	None	Normal	Normal	Normal	—	—	—	Somewhat better last 2 years	—	—	Apparent benefit from perchloride of iron with strychnia and phosphoric acid	('Brit. Med. Journ.,' May 27th, 1882.)	29
Good	Natural	—	Sounds weak, but no bruit	Natural	—	Filled on face and neck	—	Has to direct her attention to the act, as she is afraid of choking	—	Sponginess and oozing of blood twice	Large, not coated	Relaxed	Requires purgatives; states she is losing control slightly	Natural	—	40 oz. in 24 hours	1015	Acid	None	—	Lighter than healthy urine	Natural	—	—	—	—	—	—	Pilocarpin and iron beneficial	Two attacks of hæmorrhage from the throat, losing about 2 oz. the first time and 1 oz. the second. (Unpublished.)	30
—	Impaired	—	Enlarged, sounds feeble, palpitation	—	—	—	—	Sometimes painful	Few and carious	—	—	—	Difficult	—	—	Diminished	1010 to 1014	Slightly acid	Considerable quantity	Diminished	Pale	—	—	—	—	—	—	—	No effect from treatment	The author believes that in this case the myxœdema was a symptom of Bright's disease. Reported by Dr. Seppilli. ('Ann. Univ. de Med.,' 1882.)	31
Good, but less acute than formerly	Sometimes loses it for days together	—	Slight systolic aortic bruit	? Normal; pulse 72, regular	Normal	—	Respirations 15 a minute; slight chronic bronchitis	Sometimes very difficult, and has to spit out food	Several lost, but the others good	Very pale	Pale, large, fissured all over	Pale, sensibility dulled	Very slow, has to sit for a long time; bowels open once a day	Normal	—	Variable, 2 to 7 pints	1006 to 1010, sometimes 1020	Acid	None	Normal	Perhaps somewhat too pale	Normal	—	Has sudden attacks, lasting two or three minutes, in which she can see and hear, but can make no sign; afterwards has severe perspirations, and cannot speak well for some days	Slight chronic bronchitis	Better lately, fewer cerebral crises	—	—	Arsenic; says she feels much better	Has had rheumatism. (Unpublished.)	32

No.	Observer's name.	Initials of patient.	Age.	Sex.	Personal antecedents.									Bulk.	Weight.	Physiognomy.	State of skin.					Nails.	Hair.	State of thyroid, past and present.	Temperature.			Presence of watery dropsy (pitting, ascites).	Sensation.				Subjective sensations.	Occipital headache.
					Social condition.	Family antecedents.	Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.				Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.				Axillary.	Of surface.	Of internal parts.		Lost.	Perverted.	Delayed.	Of heat and cold.		
33	Gull	—	40	F.	Married; in good circumstances	—	—	—	—	Profuse	—	—	—	—	—	Gradual and general increase; much fat on trunk and extremities	—	Features broad and flattened	Fine, soft, delicate rose-bloom on cheeks; lips thickened and rose-purple	—	No masses noticed	— but not pitting; thighs 39 inches in circumference	Hands broad and spade-like, suggesting œdema,	—	Soft	Uncertain (neck being thick)	Normal	—	—	—	—	—	—	—	—
34	Gull	—	—	F.	—	—	—	—	—	Menopause	—	—	—	General increase of bulk	—	Increased	—	Placid, flattened, broad	Smooth, porcelainous, cheeks tinted rose-purple; lips large and rose-purple; alæ nasi thick	—	No masses noticed	—	Hands broad, thick, spade-like, as if textures were infiltrated; upper and lower extremities large and fat	—	Flaxen, soft	Uncertain	—	—	—	Slight œdema over tibiæ	—	—	—	—	—
35	Hadden	I. L.	40	F.	Widow, lower classes	Father died of alcoholism, and was jaundiced, æt. 46; mother, æt. 33, of phthisis, and 1 brother of phthisis; 1 sister is consumptive; 2 stepsisters have dropsy	? No	No	—	Began at 18; irregular, severe flooding once; sometimes absent for months	—	1, died in infancy of "water on the brain"	23, after acute rheumatism	Hands	Balham	—	—	Mask-like	Waxy, with flush on cheeks; upper eyelids thick and drooping	Hard, rough, scaly; never perspires; easily bruises, wounds heal slowly	Swelling above clavicles	—	Hands thickened and rough	—	Breaks off short and falls off; eyebrows scanty	Small	Nearly always subnormal; lowest 93°, highest 99·4°	—	—	Slight pitting about ankle, near an old fracture	Impaired in hands	—	—	Of cold; sudden numbness of limbs	—
36	Hall, de Havilland	—	28	F.	Single	Father died of inflammation of lungs at 46; mother alive and well at 62; 5 brothers and sisters; 1 sister, æt. 38, died of inflammation of lungs	—	—	—	Began between 13 and 14; regular, profuse, much pain, leucorrhœa	—	—	24	Face	—	—	6 st. 4 lbs. 8 oz.	—	Pale and sallow; cheeks slightly flushed; nose bulbous and rather red; eyelids swollen and œdematous looking	Harsh and dry	No fulness	—	Harsh and dry	—	Scanty, coarse, not falling; fine downy hair growing on cheeks	—	Usually subnormal, 95·6° to 98·6°	—	—	—	—	—	—	Vertical and frontal headache unpleasant taste in the mouth	—
37	Hamilton, McLane	—	55	F.	Upper middle class	Several members of family died from cardiac disease; father died of (?) myxœdema	No	—	—	Irregular	8	7 alive; none born after establishment of myxœdema	53	Face	State of Kentucky	Rather a spare person	—	Peculiar vulpine look	Pale, colour of old wax; face swollen, nose broad and flat, lips thick, eyelids puffed	Sometimes dotted with sudamina; like morocco leather	—	—	Swollen, pseudo-œdematous; skin like morocco leather	Crenated and rough	Thin, scanty, and dark	Almost completely disappeared	Left 97°, Right 96°	Not noted	In mouth, 97·2°	No ascites, slight pitting on long and deep pressure	Decided in two outer fingers of each hand	—	Yes	Intensified, especially the latter	Formication in hands; areas of coldness on arms, back and thighs; perceives metallic tastes, subjective odours	—
38	Hammond	—	41	F.	Married	—	—	—	—	—	—	—	—	—	—	General solid swelling	—	Lower eyelids and face turgid; lips, especially lower, protruded; hectic flush on cheeks	Forehead rough and swollen; nose thick	—	—	—	—	—	—	—	Never above 96°	—	Never above 96° in mouth	No pitting	—	—	Blunted	—	Finger ends felt as if there were tight thimbles on them, and soles of feet as though padded; tinnitus aurium	—
39	Harley	E. T.	38	F.	Married; lower classes	Father died of rheumatic fever, mother from an accident. Her brothers and sisters are alive and well	—	—	—	Regular, but scanty	(?) 3, two being miscarriages	1, healthy	—	—	—	—	—	—	Face swollen; cheeks red with dilated capillaries; eyelids, lips, and nose swollen; mouth half open; forehead smooth and glistening	Moles on abdomen; no perspiration; body swollen	Soft masses	—	Hands and arms dry and rough; extremities swollen and cold	Stunted	—	Not to be felt	96° to 98·2°; usually subnormal	—	—	Slight pitting of legs	—	—	—	—	—	—
40	Haward	—	66	M.	Gentleman	Mother died young of fever. Father died at 65 of heart disease. Had been in hot climates	Yes, at 18	—	Much anxiety in connection with illness and death of only brother	—	—	—	58	Supra-clavicular region	Various parts of Europe	Stout	—	Broad, puffy features	Bright patches over cheeks, but now less marked than formerly	—	Soft swellings	—	Swollen	—	—	Nothing abnormal observed	Natural	—	—	Pitting of feet and ankles	—	Of interior of mouth and throat	—	—	Browache	No
41	Heurot	D. A.	36	M.	—	Nothing special	No	—	—	—	—	—	15	Hands and feet	—	—	—	Idiotic, sensual	Lips swollen, especially lower; mouth half open. Face broad, dull white; eyelids swollen	Abdomen large, fatty	—	—	Arms and legs not enlarged; skin pale, but healthy; hands and feet hypertrophied	—	—	Hypertrophied	Normal	—	—	—	A little dull	—	—	—	Much headache	—
42	Hopkins	S. K.	52	F.	Needlewoman	Father died of abscess of liver, mother of phthisis, 1 brother of phthisis; 1 sister has severe indigestion, and one has myxœdema	No	No	Since the onset of the disease	Irregular, with leucorrhœa at puberty; always painful; profuse latterly	11	11, four of whom died probably of tubercular meningitis; eldest daughter married, has large lax abdomen, and prolapse of uterus; 1 at least born since onset of myxœdema	Before 38, her age at last confinement	Supra-clavicular region	London	Tall and spare, with very prominent abdomen	—	Expression placid	Small moles; enlarged sebaceous follicles in groove of nose; lids œdematous looking and drooping; lips thick; cheeks red	A few moles, dry, flabby, rough, wanting in elasticity; no sweating	Prominent	—	Hands dry, wrinkled, wanting in elasticity, and giving impression of loose padding beneath	Normal	Bald on top of head; no hair in axillæ or on general surface	Has never been felt	Always subnormal, average 97·2°	—	—	No	No	No	No	—	Of cold water down back, of water trickling on skin of cheek, of general coldness, of numbness and "pins and needles" in hands and feet, of shooting pains in feet, ankles, and shins also of sight and hearing	No

TABULATED CASES OF MYXŒDEMA—*cont.*

Occipital headache.	Motion.				Convulsions.	Reflexes.		Intellectual changes.													Circulatory system.					Respiratory system.	Digestive system.			
	Paralysis.	Paresis.	Retardation.	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia.	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.
—	—	—	—	—	..	—	—	Mind placid and lazy	—	—	—	Yes	—	—	—	—	—	—	Guttural, as though tongue were unwieldy	Eyes bright	—	—	—	—	Normal	Pulse 60	—	—	Normal	—	—	—	Lar
—	—	—	—	—	—	—	—	Mind gentle, placid, indifferent	—	—	—	—	—	—	—	—	—	—	Guttural, as if tongue were too large for the mouth	Cornea and pupils normal	—	—	—	—	Normal	—	—	—	Respirations 18	—	—	—	Broad tong
—	—	—	Yes, takes much longer to dress than formerly	No	Na	Plantar well marked	Normal	Yes	—	Confusion of thought	—	Yes	—	—	Sees things crawling about the floor sometimes	Good	—	Well marked	Slow, deliberate, gruff	Vision good, eyes prominent, pupils equal	Impaired on right side	Good	Good	—	Sounds normal, but feeble; accentuated 2nd sound at base	Bleeds and bruises easily; pulse full and regular, about 84	—	Dilated on cheeks	Phthisis	Occasional choking	Carious	Swollen	Large pa
—	—	—	Movements slow and deliberate	—	—	—	—	—	—	—	—	—	Is a light sleeper	Yes, inclined to be suicidal	—	Defective	—	—	Slow and deliberate	Pupils rather contracted	Fairly acute	Profuse watery discharge from nostrils	—	—	Normal, no hæmic murmur	Pulse 92, regular, very feeble	—	—	Breath sounds feeble, slight cough	—	Irregular and decayed	—	—
—	—	—	—	Not in upper extremities; ataxic gait and clumsiness, which wears off after exercise; gait like general paretic	None	Not marked	Exaggerated on both sides	In expressing ideas	Rather the reverse	Decidedly affected	Rather awkward	Morose, and easily excited	Disturbed	Imperfectly formed in beginning	Yes	Bad for recent events; would pay twice for same article	Melancholia simplex for a few months	—	Slow, hesitating, and thick; occasional elision of a syllable; difficulty greatest in linguals	Impaired in right eye, now and then in left; pupils contract normally	Diminished on right side; watch heard at 6 inches	—	Decidedly impaired	Rather deficient in red corpuscles	Normal	Sphygmograph indicated increased arterial tension	—	—	Some shortness of breath	—	—	Bleeding and spongy	Swollen lan
—	—	Muscular power weak	—	Of upper and lower extremities; gait staggering	—	—	—	Marked	—	—	—	—	Bad, occasionally waking startled	Thought that Frenchmen were trying to hurt her	Of sight and hearing	Much weakened	Yes	—	—	Pupils sluggish, double neuro-retinitis, occasional momentary diplopia	Hearing diminished in acuteness	Smell nearly absent	Much diminished	—	—	Pulse slow and feeble	—	—	—	—	—	—	—
—	—	—	Yes	Yes	—	—	Knee-jerk normal	—	—	—	—	—	—	—	—	—	—	—	Thick, slow, nasal	Pupils small, active	Deafness on both sides	—	—	White cells perhaps fewer than usual	Normal; sounds slow	—	—	—	Normal	—	Back teeth decayed	Swollen	Too la the m
No	—	—	Shuffling gait	—	—	—	—	Great slowness; objects to mental exertion	—	—	Very unsteady for first 5 years, now pretty good	Very irritable at first, not so much now	Very sleepless for first 6 years, less so now. Has horrible dreams	No	No	Fairly good	No	No	Very thick for a time, not so now	Good	Rather deaf, especially left side	Smell lost	Impaired	Natural	Natural	Pulse slow, has been 36, increased to 60	Natural	Dilated on cheeks	Respiration shallow and easily disturbed	Had difficulty in swallowing, not so now	All teeth gone	Natural	Natu
—	No	—	Yes	—	—	—	—	Yes	—	Answers well	—	—	—	—	—	—	—	—	—	Eyes very prominent; pupils equal, rather dilated to light, always inactive sight impaired	—	Nose large	—	Red cells pale, otherwise healthy	Normal	Pulse small, regular	No varicose veins	—	Normal	—	Good; hypertrophied in lower jaw	—	About the same t mouth prom extent
No	Na	No	Movements slow	Often loses her balance, making false steps to one or other side; reels about; has fallen many times; no injury	No	Normal	Normal	Slight slowness of perception	No	No imperfection	—	Placid, sometimes fretful	Good	No	No	Somewhat impaired	No	No	Slow and measured, words slurred	Muscæ, coloured spectra (rings), with closed eyes	Slight deafness and tinnitus	Almost lost	Considerably impaired	Normal	Occasionally irregularity	Normal	Normal	Dilated on cheeks	Normal	Somewhat difficult, frequent gulping, with gurgling sound	Many loose	Very spongy	Some large fis

	Circulatory system.						Respiratory system.	Digestive system.						Lymph glands.	Urinary system.								Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect	Additional information.	
	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.	Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defecation.		General state of urine.	Quantity.	Specific gravity.	Reaction.	Albumen.	Urea.	Colour.	Micturition.								
	—	—	—	Normal	Pulse 60	—	—	Normal	—	—	—	Large	—	—	—	Normal in every respect	—	—	—	—	—	—	—	—	—	—	—	—	—	—	('Clin. Soc. Trans.,' vol. vii.)	33
	—	—	—	Normal	—	—	—	Respirations 18	—	—	—	Broad and thick	—	—	—	Normal in every respect	—	—	—	—	—	—	—	—	—	—	—	—	—	—	('Clin. Soc. Trans.,' vol. vii.)	34
	Good	Good	—	Sounds normal, but feeble; accentuated 2nd sound at base	Bleeds and bruises easily; pulse full and regular, about 84	—	Dilated on cheeks	Phthisis	Occasional choking	Carious	Swollen	Large and pale	Pale and rather swollen	—	—	—	Variable, 35 to 70 oz.	1010 to 1020	—	None	Average of 19 examinations 204 gr., on a nitrogenous diet	—	—	—	Phthisis	Is becoming worse	—	—	—	Acute rheumatism at 23. Since dead. ('St. Thomas's Hospital Medical Reports' for 1880, 1881, and 1883; also 'Clin. Soc. Trans.,' 1851.)	35
	Profuse watery discharge from nostrils	—	—	Normal, no hæmic murmur	Pulse 92, regular, very feeble	—	—	Breath sounds feeble, slight cough	—	Irregular and decayed	—	—	—	Constipation	—	Phosphates and mucus	10 to 38 oz.; average 22 oz. per diem	1013 to 1025	Acid	None	104 gr and 192½ gr. per diem (2 observations)	—	—	—	—	—	—	—	—	—	(Unpublished.)	36
	—	Decidedly impaired	Rather deficient in red corpuscles	Normal	Sphygmograph indicated increased arterial tension	—	—	Some shortness of breath	—	—	Bleeding and spongy	Swollen and large	Rather increased in size than otherwise	Constipation alternately with diarrhœa	—	Phosphates and sugar; no casts	1 to 2 pints in 24 hours	1022	Acid	None	—	Light	Frequent and painful	—	—	—	Weaker when last heard of, a year ago	—	—	—	Profuse discharge of saliva at times. Hemicrania which ceased before myxœdema began. ('N. Y. Med. Rec.,' Dec. 9th, 1882.)	37
	Smell nearly absent	Much diminished	—	—	Pulse slow and feeble	—	—	—	—	—	—	—	—	Constipation	—	Excess of urates	—	—	—	—	—	—	—	—	—	—	—	—	—	—	('Neurolog. Contrib.,' No. 3, 1881.)	38
	—	—	White cells perhaps fewer than usual	Normal; sounds slow	—	—	—	Normal	—	Back teeth decayed	Swollen	Too large for the mouth	—	Constipation	—	—	42 to 60 ounces	1010 (one occasion)	—	None (tested once)	147 gr. (examined once)	Pale	—	—	—	—	—	—	—	—	('St. Thomas's Hospital Medical Reports' for 1883.)	39
	Smell lost	Impaired	Natural	Natural	Pulse slow, has been 36, increased to 60	Natural	Dilated on cheeks	Respiration shallow and easily disturbed	Had difficulty in swallowing, not so now	All teeth gone	Natural	Natural	—	Bowels act usually 4 or 5 times daily, but no diarrhœa	Natural	Natural	—	—	—	—	—	—	—	—	—	Decidedly improved in last 3 years, in mental condition. Now active, and extremities rather less swollen, but general condition of myxœdema remains	—	—	Bichloride of mercury and iodide of potassium	Since syphilis at 18 has occasionally suffered from ulceration of nostril and once ulceration of lip which always yielded to iodide of potassium with or without bichloride of mercury. After the mental anxiety of 1875 he lost sleep, and soon after was attacked with syphilitic disease at base of brain, probably gummata, and chronic meningisis about neighbourhood of 5th pair of nerves. (Unpublished.)	40
	Nose large	—	Red cells pale, otherwise healthy	Normal	Pulse small, regular	No varicose veins	—	Normal	—	Good; hypertrophied in lower jaw	—	About twice the normal size; fills the mouth and protrudes externally	—	Normal maxillary glands since childhood	Slow and painless enlargement of submaxillary glands since childhood	A little sugar	—	—	—	None	—	—	Normal	—	—	—	—	Vomited much before death	—	—	Great hypertrophy of the lower jaw and other bones; parotid swellings; much thirst. Drawing of patient given. ('Union méd. du nord-est,' December, 1882.)	41
	Almost lost	Considerably impaired	Normal	Occasionally irregularity	Normal	Normal	Dilated on cheeks	Normal	Somewhat difficult, frequent gulping, with gurgling sound	Many loose	Very spongy	Somewhat large and flabby	Somewhat œdematous looking	Accompanied by prolapsus ani	Normal	—	3 to 4 pints daily	1008 to 1010	Acid	None; examined during 3 years	—	Light straw	Normal tion; general relaxation and softness of parts	Prolapse of uterus during defecation	Crises with no great regularity	—	Increased weakness, feels about more	—	—	Nil	Heat pleasant even in coldest weather when skin has perspired; cold readily felt; some twitching of legs at times with shooting pains as she lies in bed. Habitual abdominal distension. Severe pain. Since dead. (Incomplete account in 'Lancet,' 1881.)	42

No.	Observer's name.	Initials of patient	Age.	Sex.	Personal antecedents. Social condition.	Family antecedents.	Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.	Bulk.	Weight.	Physiognomy.	State of skin. Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.	Nails.	Hair.	State of thyroid, past and present.	Temperature. Axillary.	Of surface.	Of internal parts.	Presence of watery dropsy (pitting, ascites).	Sensation. Lost.	Perverted.	Delayed.	Of heat and cold.	Subjective sensations.	Objective headache
43	Hopkins	H. M. P.	56	F.	Cook	Father gouty; mother and a brother died of phthisis; a half-sister (by father) is becoming like patient "in appearance more and more"	No	No	Great mental trouble 12 years ago, and twice since	Since 16, profuse, and accompanied by severe sacral pain	2	2, born since onset of myxœdema	24, during first pregnancy	Above collar-bones, and soon after in eyelids	London	Very fat, big belly, flatulent distension	—	—	Dry, rough, tense, and shining, loss of elasticity, small moles, small fibromata, and closely adherent small scales; no sweating; face very œdematous looking, eyelids much puffed, cheeks red, lips thick and somewhat blue	Loose and flabby	Very prominent	—	Hands dry and wrinkled; a feeling of soft, loose padding beneath	Normal	Very scanty on head, parting being wide; none in axillæ and on general surface	Cannot be felt owing to short neck and œdematous tissue	96° to 98°, uniformly subnormal	—	—	Some œdema about eyelids	No	No	No	Normal	Always cold, sensation of cold water down back and of water trickling down cheeks, numbness and pins and needles in hands and feet	No
44	Howden	Mrs. L.	48	F.	Baker's wife	Mother died lately of apoplexy, age 84	No	No	No	Always very regular; sometimes menorrhagia	7, no miscarriages	7; 1 killed accidentally, others alive; 1 has congenital paralysis; none born since establishment of myxœdema	40	Legs	Montrose	Increased since myxœdema appeared	Not weighed	Heavy and flabby	Rosy cheeks and patch on forehead	Skin generally dry, parched, pale yellowish white; no perspiration	—	—	—	Normal	Has fallen; a little left on occiput	Enlarged very much before death	—	—	—	No	—	—	—	—	Always complains of cold, frontal headache	No
45	Howden	Mrs B.	58	F.	Publican's widow	Illegitimate	No	No	—	—	—	8; 7 alive, youngest wants eyebrows; not known if any born after establishment of myxœdema	Between 40 and 50	When noticed, general	7 years in Montrose Asylum, previously in Dundee	5 ft. 3 in. high	14 st.	Dull and heavy	Cheeks pink, lips livid; dry, waxy-looking, never perspires	—	—	Swollen	Swollen and latterly œdematous	Normal	Almost entirely absent, except eyelashes and a few hairs on pubes	Normal	96·8° to 97·8°	—	—	—	No	No	Somewhat	—	Always complains of cold	No
46	Howden	Miss C.	52	F.	—	—	—	—	—	Ceased 2 years ago	—	—	50, about menopause	Face	Montrose	—	—	Dull, heavy, expressionless	Dry, yellowish white, waxy cheeks	—	Much swollen	—	Slightly swollen	Brittle	Coming out	—	97·5°	—	—	No pitting	—	—	—	—	Complains of cold; vertical and frontal headache	No
47	Inglis	T. W.	—	M.	Plumber	—	—	No	Yes, wife misconducted herself	—	—	2, healthy	—	Face	—	—	—	Cretinoid	Eyelids puffy, wrinkled, wax-like; nose widened; lips thick and heavy, lower protruding	Swollen, dry; occasional short perspirations	—	—	Hands large, spade-like, stiff, cold; extremities swollen and dry	—	—	—	95°	—	—	No pitting	Impaired	—	—	—	Of cold	—
48	Inglis	—	39	F.	—	Mother died of apoplexy; a sister has had puerperal fever	—	—	—	—	—	8, healthy	34	—	—	—	—	—	—	—	—	—	Warty growths on arms	—	—	—	—	—	—	None	—	—	—	—	Of cold	—
49	Jacob	—	82	F.	Poor	—	No	No	No	Regular since commencement of symptoms	3, has had 1 miscarriage	2	28, soon after a confinement	Abdomen	Leeds	Looks well nourished	About 8 st.	—	Sallow, puffy, especially below eyes; never perspires; slightly blue tint on cheeks; lips thick and pouting	Slight fulness in parts	Considerable fulness	—	Hands and forearms hard, red, and rough. Palms dry and fissured; says she cannot get them clean	—	Falling for some time, but there is a fair amount	Cannot be felt. Has not noticed anything with regard to it	—	—	—	Occasional œdema of feet	—	—	Slightly impaired sensation generally, but considerably so in hands and feet	—	Generally feels cold	Considerable forms chief pla
50	Kirk	—	67	F.	In poor circumstances	Father, an habitual drunkard, died, æt. 63, of insanity and epilepsy; mother died at 62 asthmatic	Yes	No	Much grief and anxiety	Ceased at 44	6	4; none born since myxœdema began	44 (about menopause)	Whole body seemed to swell together	Glasgow	—	Not known	Expressionless and mask-like	Rounded face, alæ nasi thick, nose flattened, eyelids swollen, ears swollen and pulpy, lips thick, syphilitic cicatrices	Swollen and pulpy; no perspiration	Thickened; fatty masses	Formerly swollen, but not now	Thick and clumsy, especially hands; moles on arm and leg	Brittle	Scanty on scalp, nearly absent on axillæ and pubes, eyelashes thin and stumpy	Apparently atrophied now. Past condition not known	96·4° to 98·8°	—	—	None	No	No	Yes	Delayed	Coldness, giddiness, frontal headache, tinnitus	No
51	Laider	—	34	F.	Domestic servant, single	Parents dead; mother died of consumption; 1 brother spits blood, 1 sister dead, 4 sisters and 3 brothers alive	—	—	—	Ceased 5 years ago	None	None	32	Arms and face	Born in Somerset; has lived in London 12 years	Stout	7 st. 8¼ lbs.	—	Soft, not dry; very pale; full and puffy, especially about eyelids	Soft, not dry, very pale	—	—	Harsh and dry	Normal	Normal on scalp; eyebrows, and hairs on axillæ and pubes deficient	Formerly full, now absent	Usually subnormal, 97·2°	—	—	None	Impaired	—	—	Normal	Prickling sensations over surface; frontal headache	No
52	Lattey	—	59	F.	Wife of a carpenter and small grocer	Nothing definite to be learned from patient	No	No	No	Ceased at 51	2	2; 1 died æt. 4; 1 alive, æt. 28	50	Eyelids for more than 9 months continuously	An aguish district (? Essex) up to age of 30; once had ague	—	—	Vacant	Dry, rough, and harsh; face broadened about mouth and lower jaw; high colour on cheeks; lips everted and thickened; angles of mouth depressed	—	—	—	Dry, rough, and harsh on hands, feet and legs; hands thickened, especially fingers; wedding ring embedded in solid œdema, not fat, of which there appears to be but little anywhere	Broad and thick	Almost completely gone; over part of head it grows a little, and then breaks off short	Nothing can be felt of thyroid	97°	—	In mouth 97·7°	Watery dropsy slightly in both legs and decidedly in eyelids	—	—	Apparently so over all parts of body	—	—	—
53	Lediard	E. D.	54	F.	Lower Irish, ill educated	Mother died at 60, father at 40, cause unknown	No	No	No	—	—	11, five of whom are alive	54, nine months before admission	—	Tipperary; England 20 years	Clumsy	Not noted	Dull, heavy, expressionless	Swollen, waxy looking, cheeks delicately tinted	Thick, dry, harsh, not pitting	—	—	Thick, dry, harsh	—	Black and plentiful	Not felt, neck very fat	Averaged 96° to 97°	—	—	No true œdema	—	—	—	—	—	No coplain of
54	Lloyd	H. W.	39	F.	Cook	Father died æt. 59, of dropsy; mother alive at 80, rheumatic; grandfather died in a lunatic asylum	No	No	—	Began between 14 and 15; regular up to date	—	—	31	Face, especially eyelids	London	—	—	Dull	Shiny, injected	Dry, especially in chest; no perspiration	—	—	Hands swollen and cold; skin on dorsum harsh and rough	—	Thin, dry, harsh	Easily felt, but slightly diminished in size; neck full	Low, never above 98·4°, average 98°; has been 97°	—	—	None	—	—	Yes	—	General sensation of cold	At ti

TABULATED CASES OF MYXŒDEMA—*cont.*

Subjective sensations	Occipital headache	Motion. Paralysis	Paresis	Retardation	Inco-ordination (falls, injuries thereby)	Convulsions	Reflexes. Superficial	Deep	Intellectual changes. Slowness	Abnormal persistence in thought and action	Imperfection or perfection of mental processes	Writing	Irritability	Sleep	Delusions	Hallucinations	State of memory	Insanity	Agoraphobia	Changes in speech	Eyes and vision	Ears and hearing	Nose and smell	Taste	Circulatory system. Blood	Heart	Arteries	Veins	Capillaries	Respiratory system	Deglutition	Teeth
Always cold, sensation of cold water down back and of water trickling down cheeks, numbness and pins and needles in hands and feet	No	No	No	Movements slow	An unsteady step very occasionally, no falls	3 epileptic fits in the 12 years preceding 1882, many since, at present one a month; legs start in bed at times, especially after fits	Normal	Normal	Doubtful	No	No imperfection	—	No	Sleeps much	No	No	Not as good as formerly	No	No	Speech slow, words slurred over, slight nasal intonation	Normal	Normal	Normal	Normal	—	Sounds weak	Pulse 60, slightly irregular	Some cyanosis of lips	Permanently enlarged on cheeks	Normal	Accompanied by the noise of "œdematous throat"	—
Always complains of cold, frontal headache	No	No	No	Yes	Yes, frequent falls	No	—	—	—	—	—	—	No	Good	—	—	Good	—	—	Thick, indistinct, slow	Defective; eyes water	Good	Good	Good	—	Weak, no murmur	—	Dilated	—	—	—	All le
Always complains of cold	No	No	No	Very sluggish	Yes	No	Normal	Patellar reflex absent	Yes	—	—	Difficulty owing to condition of hands	Yes	Sleeps very little	Persistent; thinks she is possessed of land and wealth, of which people are trying to rob her	Of hearing	Good for old, defective for recent events	Yes, monomania of suspicion	—	Thick and laboured	Cataract in left eye; ophthalmia tarsi	Normal	Defective	Normal	—	Mitral systolic murmur	Atheromatous; pulse 76, weak	Superficial, dilated	Dilated	Tendency to take cold, causing laboured respiration	Difficult at times	Abse
Complains of cold; vertical and frontal headache	No	—	—	—	—	—	—	—	—	—	—	Not affected	Yes	Sleeps well	—	—	Bad for recent events	—	Yes	Difficulty in speaking	Eyes weak and smarting	Good	Good	Good	—	—	Pulse 66, feeble	—	—	—	—	Loo
Of cold	—	—	Grasp of hands feeble	—	—	—	Plantar absent	—	Yes	—	Some imperfection	—	—	Sleeps much	—	—	Slightly impaired for recent events	Acute melancholia with suicidal tendencies at an early period. Melancholia followed by mania; is becoming demented	—	Slow, indistinct, and paretic	Good	Rather deaf	Good	—	—	Sounds slow, but healthy	—	—	—	—	—
Of cold	—	—	Of arms and legs	—	—	—	—	—	Yes	—	Imperfection	—	Yes, without cause	—	Yes, thought she was a queen, &c.	Perversion of the special senses. Said everything smelt of gunpowder	Fair	—	—	—	Good	—	Impaired	Impaired	—	Regular, second sound accentuated	—	—	—	—	—
Generally feels cold	Considerable; forms the chief complaint	—	—	Walks slowly	Not marked. Occasionally staggers, but has never fallen	None	Normal	Normal	To some extent	—	—	—	—	—	—	—	Decidedly impaired	—	—	Slow and sometimes hesitating	—	Cannot hear a watch anywhere, but can hear conversation when loud and distinct	—	—	No increase of leucocytes, corpuscular richness normal	Normal	Normal	Normal	Normal	Normal	—	—
Coldness, giddiness, frontal headache, tinnitus	No	No	No	Yes, gait slow	One or two falls; no marked incoordination	None	Absent	Absent	Yes	—	Perfect, but slow	(Specimen sent)	Occasional	Sleeps little at night, drowsy during the day	None	None	Tolerable	None	None	Slow, nasal, monotonous	Slight presbyopia, otherwise normal	Normal	Normal	Normal	—	Præsystolic murmur; accentuated 2nd sound over aortic area	Pulse 80 to 92, fairly steady	Hæmorrhoids	Dilated on cheeks	Respirations 18, shallow, no abnormal sounds	Difficult	S le
Prickling sensations over surface; frontal headache	No	—	—	—	—	—	Normal	Normal	—	—	—	Fairly good	—	Good; frequent disagreeable dreams	—	—	—	—	—	Slow	Good	Good	Good	Good	Apparently quite normal	Apex in normal position, no thrill; short blowing murmur at apex and left base (hæmic)	Normal	Normal	—	Healthy	Good	Much of up tee
—	—	—	—	—	Has often fallen, sometimes backwards; has bruised herself much on several occasions	Attack of unconsciousness and convulsions, lasting an hour, 9 years ago; has not been well since	Plantar reflex absent	Knee-jerks very feeble; no ankle-clonus	Slow in grasping one's meaning in conversation, probably due solely to deafness	—	—	Writes very slowly, but expresses herself well and to the point. Education very imperfect	Very quiet and even in her temper, more so than formerly	Says she can go to sleep anywhere and always	None	None	Defective	None	None	Very slow and deliberate	Vision not so good as formerly	Hearing very much diminished	Smell said to be good	Very slight	—	Sounds very feeble and distant	Normal, pulse 60	Normal	Always injected on cheeks	Usually some cough	Slow	Only 1 and th are v loos
—	Not complained of	No marked change	No marked change	No marked change	No marked change	Several fits	—	—	Very marked	—	—	—	—	Frequently found nodding	—	—	Defective	—	—	Thick, indistinct	Healthy	? dull	Not altered	No defect noted	Nothing abnormal	Healthy	—	—	—	—	—	No te
neral sensation of cold	At times	—	Head falls forward	Does her work thoroughly but slowly	—	—	—	Normal	Yes	—	—	—	At times	Disturbed by dreams	—	—	Impaired	—	—	Slow, intonation flat, as though she had a nasal cold	Good	Impaired	Good	Impaired at times	—	No murmur; 1st sound weak, 2nd accentuated and reduplicated	—	—	Injected on cheeks	Expansion good, occasional rhonchus	Normal, but slow	Some

	Circulatory system.					Respiratory system.	Digestive system.						Lymph glands.	Urinary system.								Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information.	
Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defecation.		General state of urine.	Quantity.	Specific gravity.	Reaction.	Albumen.	Urea.	Colour.	Micturition.								
Normal	Normal	—	Sounds weak	Pulse 60, slightly irregular	Some cyanosis of lips	Permanently enlarged on cheeks	Normal	Accompanied by the noise of "œdematous throat"	—	—	Large and flabby	Œdematous-looking	Some prolapse of anus in the act	Normal	—	12 to 59 oz. per diem. (bowels being open once a day)	1010 to 1015	Acid	About $\frac{1}{25}$ for 2 years at least	—	Pale straw	Occasional loss of control	Prolapse of uterus during defecation	Aggravation of symptoms at time of fits, once a month	Acute attacks of gout in feet every 2 or 3 months	Becoming worse rapidly	—	—	None	Was a very delicate child, did not walk until 3¼ years old, did not play about. Still lacks mental energy. Was treated for dropsy 12 years ago, and grew 10 years ago. Has fixed pain over sacrum, at times very distressing. Since dead. (Unpublished.)	43
Good	Good	—	Weak, no murmur	—	Dilated	—	—	—	All loose	Purple	Swollen	—	Costive	—	—	—	—	—	—	—	—	—	—	Climacteric at 47	—	—	Suffocation	Died from œdema of glottis and lungs	—	(Unpublished.)	44
Defective	Normal	—	Mitral systolic murmur	Atheromatous; pulse 76, weak	Superficial, dilated	Dilated	Tendency to take cold, causing laboured respiration	Difficult at times	Absent	Purple	Very much swollen, at times more so than at others	Œdematous	Costive	—	Deposit of mucus	Normal	1014	Acid	Never any	—	Pale	At times frequent	—	—	Frequent attacks of erysipelas and diarrhœa	—	Exhaustion from erysipelas and diarrhœa	No wasting; dropsy in legs	Digitalis and iron beneficial as regards heart	(Unpublished.)	45
Good	Good	—	—	Pulse 66, feeble	—	—	—	—	Loose	Pale	Swollen	—	Costive	—	Cloudy, slight deposit of mucus	Normal	1028	Acid	None	—	Pale	—	—	—	—	—	—	—	—	(Unpublished.)	46
Good	—	—	Sounds slow, but healthy	—	—	—	—	—	—	—	Too large for the mouth, not œdematous	—	Bowels constipated	—	—	—	1015	—	None	—	—	—	—	—	—	—	—	—	Insanity was the first symptom noted. ('Lancet,' Sept. 25th, 1880.)	47
Impaired	Impaired	—	Regular, second sound accentuated	—	—	—	—	—	—	—	—	—	—	—	Natural	—	1010	—	—	—	—	—	—	—	—	—	—	—	—	('Lancet,' September 25th, 1880.)	48
—	—	No increase of leucocytes, corpuscular richness normal	Normal	Normal	Normal	Normal	Normal	—	—	—	—	—	—	—	—	—	1008	Acid	Occasional trace	0·8 per cent. once	Pale	—	—	—	—	Slight improvement in last 3 months	—	—	At first pilocarpine produced some improvements, making the skin slightly moist. Later it did not seem to agree. Iron, nux vomica, pot. iod., gr. v to gr. xv tried. Improvement under general tonic treatment	Sometimes "loses" herself for few moments. (Unpublished.	49
Normal	Normal	—	Presystolic murmur; accentuated 2nd sound over aortic area	Pulse 80 to 92, fairly steady	Hæmorrhoids	Dilated on cheeks	Respirations 18, shallow, no abnormal sounds	Difficult	8 left	Good	Much swollen	Much swollen	Difficult formerly, but not now; is costive	Never swollen	Much vesical mucus; no sugar; uric acid and corresponded	25 oz. phosphates with diminished quantity of urine	—	Feebly acid	None	170 to 180 grains per diem	Pale	No difficulty	—	—	—	Stationary	—	—	None	Photograph sent. Had acute rheumatism at 28. ('Glasgow Med. Journ.,' January 1st, 1884.)	50
Good	Good	Apparently quite normal	Apex in normal position, no thrill; short blowing murmur at apex and left base (hæmic)	Normal	Normal	—	Healthy	Good	Much decay of upper teeth	Normal	Normal	Normal	Normal	—	Pale and clear	Diminished	1012	Acid	None	3·4 per cent., about normal	Light	Difficult, frequent	—	—	—	Advancing slowly	—	—	Tonics. General condition improved	Had rheumatic fever 3 years ago. Arms and legs were affected, and have been stiff, painful, and often swollen since. (Unpublished.	51
Smell said to be good	Very slight	—	Sounds very feeble and distant	Normal, pulse 60	Normal	Always injected on cheeks	Usually some cough	Slow	Only 15 left, and these are very loose	Apparently swollen	Clean	—	Bowels not open more than once a week or fortnight; sometimes has diarrhœa	—	Excess of mucus, but none of lithates or phosphates	2 to 4 pints	1020	Acid	None	—	Pale yellow rises at night to pass water	Not more frequent than usual; rarely	—	Diarrhœa occasionally	—	No change in the 4½ years she has been under observation; occasional diarrhœa and indigestion	—	—	None, except for her occasional diarrhœa	('Lancet,' June 29th, 1882.)	52
Not altered	No defect noted	Nothing abnormal	Healthy	—	—	—	—	—	No teeth	—	Always clean and moist	Œdematous	Natural	Subject to occasional enlargements and tenderness, preceded by shivering	—	—	—	—	None	—	Pale	—	—	—	No change during 8 months	—	—	Pilocarpine caused free sweating	Slight injuries, such as a pin's prick, caused unusual ecchymoses. ('Lancet,' April 30th, 1881.)	53
Good	Impaired at times	—	No murmur; 1st sound weak, 2nd accentuated and reduplicated	—	—	Injected on cheeks	Expansion good, occasional rhonchus	Normal, but slow	Sound	Thickened	Large and flabby	Swollen	Constipation	—	—	—	1030	Acid	None	—	Clear	Normal	—	—	—	Very slow	—	—	Jaborandi, iodide of potassium in doses of 3ss, iron, &c., without any effect	('Clin. Soc. Trans.,' vol. xiv.)	54

No	Observer's name.	Initials of patient	Age	Sex	Personal antecedents: Social condition.	Personal antecedents: Family antecedents.	Personal antecedents: Syphilis.	Personal antecedents: Alcohol.	Personal antecedents: Mental disturbance.	Personal antecedents: Catamenia.	Personal antecedents: Pregnancies.	Personal antecedents: Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.	Bulk.	Weight.	Physiognomy.	State of skin: Face.	State of skin: Body.	State of skin: Supra-clavicular region.	State of skin: Vulva.	State of skin: Extremities.	Nails.	Hair.	State of thyroid, past and present.	Temperature: Axillary.	Temperature: Of surface.	Temperature: Of internal parts	Presence of watery dropsy (pitting, ascites).	Sensation: Lost	Sensation: Perverted.	Sensation: Delayed	Sensation: Of heat and cold.	Subjective sensations.	Objective sensations.
55	Lloyd	H. C.	65	F.	Pauper	Good	Uncertain	—	—	—	—	—	62	Face	Present Lambeth	—	—	—	Reddish complexion; œdematous looking, no pitting; flush on cheeks; eyelids puffy	Dry, very little perspiration	Fatty tumour on right side	—	Hands rough, chapped; purpuric spots on dorsum	—	—	Scarcely detected	—	—	—	No pitting; no ascites	—	—	—	—	—	—
56	Lunn	G. M	47	M.	Married; has been a milkman and policeman; infirmary patient	Father and mother dead; cause unknown	No	No	No; no fright	—	—	4	42	—	—	—	16 st.	Outline of face not distinguishable	Puffy and translucent lower lids, suggesting renal disease; several moles	Harsh, dry, and scaly	Very full and puffy	—	Harsh, dry, and scaly, with a boggy feeling	Apparently not much altered	Grown on head and face since admission; a few hairs on pubes and axillæ	Not to be felt	96° to 97·2°	—	Same as axillary when taken on admission	Pitting on back of hand and foot	—	—	—	—	—	Some tumour
57	Lunn	Mrs J.	45	F.	Infirmary patient	Mother alive and healthy	No	No	No; no fright	Ceased; severe hæmorrhage from uterus once or twice	13, five miscarriages	8; none born since present illness; 4 dead, cause unknown	41	Hands and feet	Now at Marylebone Infirmary	—	Not weighed	Face puffy and bloated	Puffy	Dry, harsh, scaly	Very full and puffy	—	Boggy feeling about ankles; skin dry and scaly	Apparently not much altered	Only a few hairs on pubes; a little hair on each side of vertex	Not to be felt	96° to 97·2°	—	Same in mouth as in axilla	Pitting on back of hand and front of ankle	—	Slight hyperæsthesia when pricked	—	—	—	Lancinating pains
58	Lunn	A W	69	F.	Infirmary patient	Father and mother dead; cause unknown	No	No	No	—	7	7; 2 alive, rest died young, cause unknown; none born since present illness	About 57	Not observed	Marylebone	—	—	—	A few moles; face puffy and bloated	Dry and scaly	Very full and puffy	—	Dry and scaly	—	A little hair on each side of vulva; none on pubes	Not to be felt	94·6° to 97°	—	—	Pitting on back of hand and front of ankle	—	—	—	—	—	—
59	Lunn	J. B	77	F.	Unmarried	Father and mother died of old age; 1 brother has sacro-iliac disease; her only sister died of dropsy, and was said to be very fat for 3 years before death	No	No	No	Ceased at 40	None	None	—	—	Lived in Cleveland Street all her life. Born in London	—	9½ st.	Has the appearance of a cretin	Translucent	Harsh and puffy; never perspires	Full	—	Slightly scaly on forearms	Normal, no splitting	Absent in axilla; scanty on pubes and head	Not to be felt	Always subnormal	Always subnormal	Always subnormal	No pitting and no ascites	—	—	—	—	—	Not ob
60	Mackenzie S.	—	51	M.	Seaman	Mother died at 81; father killed; 1 sister living 1 died of dropsy, and the other had fits	Probably not	No excess	None	—	—	—	46	Limbs	Born in Kent; at sea since 17	A big, well-developed man	—	Characteristic; heavy, puffy look of face	Swollen, semi-translucent, dry, red flush on cheeks; colour everywhere a little yellow; lips swollen; alæ nasi thickened; eyelids look œdematous	Swollen	Nothing noticeable	—	Hands swollen and clumsy looking, calves very large and firm	—	Scanty and wiry	Seems decidedly atrophied.	Slightly subnormal	—	—	Slight pitting of legs	—	—	Yes	—	Numbness, especially of hands	—
61	Mahomed	J. K.	30	F.	Married; out-patient	Mother died suddenly from "cold;" father alive and healthy; 6 brothers and 4 sisters; 1 sister died when pregnant, others alive and healthy	—	—	—	Absent (is suckling); present later	Much blood lost in her labours	7; 6 alive, 1 died of bronchitis, youngest 8 months	About 29, at the end of last pregnancy	—	—	—	—	—	Broad, waxy, puffy; lips blue; much swelling below eyelids; cheeks bright pink; no pitting	White, dry, harsh	—	—	Hands hard, brawny, swollen, stiff; no pitting; skin dry and harsh	—	—	—	—	—	—	—	—	—	—	Dull pain at top of head, especially towards evening	—
62	Miller	—	38	F.	Indifferent	Father living; mother twice in an asylum, afterwards died of cancer of the breast	No	No	Much worried until lately	Not since 1872	3	1 alive, 1 died of convulsions, 1 of tabes mesenterica. All born after establishment of myxœdema	26	Abdomen, then legs, face, eyes, and hands	Woolwich	Ordinary	10 st. 11 lbs., 5 yrs. ago 10st. 6lb., before marriage 10 st.	Somewhat apathetic	Shiny, sallow, dry, and translucent	Dry	Dry	Dry	Shiny and dry	Curved	Nearly gone; that left is friable	Atrophied	95°	—	Mouth 95·6°	None at present	—	—	Yes	Delayed	Yes	Yes
63	Morvan	—	—	F.	—	—	—	—	—	—	—	8	55	Face	Lower Brittany	—	—	—	Swollen; lips thick; nose flattened; eyelids puffy, drooping	Dry, powdery, back and abdomen much swollen	—	—	Hands, forearms, feet and legs swollen, but not arms and thighs	—	—	—	98° to 98·7° (3 observations)	—	—	—	No	No	No	—	—	—
64	Morvan	M. J. G.	27	F.	Wife of a farmer	Nothing like myxœdema in family; father died at 67 of bronchitis; mother alive at 67; a sister died paralysed in an asylum	—	—	—	Began at 18, irregular	None	None	24, before marriage	—	Lower Brittany	—	—	Expressionless, placid	Swollen; eyelids thick and transparent; nose flattened; cheeks red	—	—	—	Legs, wrists, and fingers œdematous looking	—	—	—	97·5° to 97·8° (2 observations)	—	—	—	No	No	No	—	—	—
65	Morvan	M. A. R.	44	F.	Wife of a farmer	Mme. T. (see below) is a relative	—	—	—	Began at 18, scanty, irregular; occasional hæmorrhages of late	1	1 born 8 years after commencement of disease	24	—	Lower Brittany	—	—	—	Eyelids swollen, translucent; nose flattened; lips thick and livid	—	—	—	Swelling of legs and wrists	—	—	—	—	—	—	Slight over tibia	—	—	—	—	—	—

TABULATED CASES OF MYXŒDEMA—*cont.*

	Subjective sensations.	Occipital headache.	Motion.				Convulsions.	Reflexes.		Intellectual changes.														Circulatory system.					Respiratory system.	Deglutition.
			Paralysis.	Paresis.	Retardation.	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia.	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		
	—	—	—	—	—	—	—	—	—	—	—	Mental condition fairly good	—	—	—	—	—	—	—	—	—	—	—	—	—	Faint aortic systolic murmur; no hypertrophy	Pulse 60, non-compressible, not atheromatous	—	—	A few scattered rales; some cough	—
	—	Sometimes	None	? None	Locomotion slow	A fall 5 years ago, and cut his head open	None	Normal	Normal	—	—	—	—	Sometimes very irritable	Very sleepy in cold weather	Delusions 5 years ago; rather unmanageable	—	Good	—	—	Blurred and slow	Good	Rather deaf with both ears	Good	Good	—	Sounds weak; no murmur	Not rigid	—	—	—	Fairly good
	—	Intense at times	None	None	Yes	Clumsy with fingers, *e.g.* in picking up pins; no falls	None	—	—	—	—	—	Can write, but not very well	—	Very sleepy in cold weather	—	—	Fairly good	No	—	Slow, blurred, indistinct	Good	Rather deaf with both ears	Good	Good	—	Sounds weak	Not rigid	—	—	—	Fairly good
	—	—	—	—	Locomotion slow	—	Had a sort of fit	—	—	—	—	—	—	—	Drowsy during cold weather	—	—	—	No	—	Hesitates before speaking	—	—	—	—	—	Normal	—	—	—	—	Good
	—	Not often	—	None	Locomotion slow	—	None	—	Patellar reflex nearly absent	—	—	—	Good	When offended	Not very good	Yes, years ago	Yes, years ago	Good	—	—	Slow	Good	Good	Good	—	—	Sounds normal	—	—	—	Normal	Good
	Numbness, especially of hands	—	None	None	Gait slow and staggering	Not noticeable; no falls	—	—	Knee-jerks present, but delayed	Present	—	—	—	—	Good	None	None	Good	None	Not complained of	Slow, monotonous	Can read No. 5 Nettleship; no change in fundus	Good	No subjective derangement	—	—	Sounds feeble, but normal; 48 to 80 beats per minute	Not thickened, tension not increased	No noticeable change	Dilated on cheeks	Natural; 16 respirations per minute	Good
	Dull pain at top of head, especially towards evening	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Good	—	—	Slow, drawling, deliberate	Unchanged	Unchanged	—	—	—	Impulse not felt, sounds normal, the second rather accentuated	Pulse of not unusually high pressure, though persistent	—	Dilated on cheeks	Normal	—
	Yes	Yes	No	No	Yes	Yes, trivial falls	No	—	—	Yes	—	Perfection	As good as ever	No	Imperfect, persistence of dreams	Yes, persistent	Yes, persistent	Bad for recent events	—	Yes	Distinct, but slow and measured	As good as ever	Not so good as formerly	Not so good as formerly	Not so good as formerly	No grave defect microscopically	Sounds weak	—	—	—	Fairly normal	Imperfect
	—	—	—	Yes	Yes	Numerous falls; hands clumsy	—	—	—	—	—	Perfection	—	—	—	Yes	Yes	—	Yes	—	Slow, hoarse	Eyes watery; vision impaired	—	Obstinate discharge from nose	—	—	Healthy	Hæmic bruit in carotids	—	—	Bronchitis	—
	—	—	—	Yes	Yes	Of hands	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow	Eyes watery	—	Incessant discharge from nose	—	—	Normal	Pulse 60, regular, easily compressible	—	—	—	—
	—	—	—	Yes	Yes	—	—	—	—	—	—	—	—	—	—	—	Yes, during an attack of bronchitis	—	—	—	Slow, hoarse	Eyes watery	—	—	—	—	Normal	Hæmic bruit in carotids	—	—	Bronchitis	—

	Circulatory system.						Respiratory system.	Digestive system						Lymph glands.	Urinary system.							Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information.	No.
Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defecation.		General state of urine.	Quantity.	Specific gravity.	Reaction.	Albumen.	Urea	Colour.	Micturition.								
—	—	—	—	Faint aortic systolic murmur; no hypertrophy	Pulse 64, non-compressible, not atheromatous	—	—	A few scattered rales; some cough	—	—	—	Clean, swollen, fissured	Uvula elongated	Constipation	—	Phosphates, but no bladder trouble	Average	—	Alkaline	None	—	—	—	—	—	—	—	None	—	From Dr. Ord's notes. Since dead (Unpublished.)	56
Rather deaf with both ears	Good	Good	—	Sounds weak; no murmur	Not rigid	—	—	—	Fairly good	Fairly good	Slightly œdematous	Rather big	—	Bowels regular	None appear coloured	No sugar	Varies much, 34 to 38 oz. per diem	—	Neutral	A trace once or twice	194·48 on one occasion	Amber	—	No desire	—	None	Stationary	—	—	Ergot and sometimes a tonic, and two ounces of gin daily. Acetic acid to head for alopecia. Good diet	('Clin. Soc. Trans.,' vol. xv.)	56
Rather deaf with both ears	Good	Good	—	Sounds weak	Not rigid	—	—	—	Fairly good	Not good	Apparently œdematous	Large and flabby	Nothing special noted	Fairly regular with medicine	Not enlarged	No sugar	Varies	1020	Neutral	Trace	6·78 grains per ounce	Amber colour	Normal	—	—	None	About the same	—	—	Good living, iron and quinine, attention to general health	('Clin. Soc. Trans.,' vol. xv.)	57
—	—	—	—	Normal	—	—	—	—	Good	Good	Good	Good	—	Bowels rather confined	Not enlarged	—	20 to 40 oz. per diem	1020	Acid when admitted	A good trace when admitted, none later	—	Pale	—	—	—	None	Improved in general health	—	—	Steel wine, acetic acid and cantharides to head	('Clin. Soc. Trans.,' vol. xv.)	58
Good	Good	—	—	Sounds normal	—	—	—	Normal	Good	Absent in upper jaw, fairly good in lower	Good	Good	—	Normal	Not enlarged	Normal	Average 54 oz. per diem	1011	Acid	None	—	Amber	Frequent	—	—	Ulcerated leg	—	—	—	None except rest and lotion for leg	(Unpublished.)	59
Good	No subjective derangement	—	—	Sounds feeble, but normal; 48 to 80 beats per minute	Not thickened, tension not increased	No noticeable change	Dilated on cheeks	Natural; 16 respirations per minute	Good	Many fallen during last 18 months, remaining ones loose	—	Little, if any swelling	Little, if any, swelling	Natural	No enlargement	—	20 to 40 oz.	1010 to 1023	Generally acid	Doubtful trace; only with picric acid	1·6 per cent.	Straw	Natural	—	None	None	Stationary	—	—	—	Has had smallpox and dysentery; facial erysipelas five years ago ('Clin. Soc. Trans.,' vol. xvi.)	60
Unchanged	—	—	—	Impulse not felt, sounds normal, the second rather accentuated	Pulse of not unusually high pressure, though persistent	—	Dilated on cheeks	Normal	—	—	—	Coated with thin, white fur	—	Naturally costive	—	—	Normal	1022	Acid	None at first, present afterwards, much when last seen	—	—	Normal	—	—	—	—	—	—	Acid. hydrobromici, mxx t. d. s. for 2 weeks; no improvement. Sol. nitroglycerine mij (1 p. c. sol.) t. d. s.; great improvement for 3 weeks. Soon relapsed into same condition as before	Pulse-tracing given. (Trans. Soc Trans.,' vol. xv.)	61
Not so good as formerly	Not so good as formerly	Not so good as formerly	No grave defect microscopically	Sounds weak	—	—	—	Fairly normal	Imperfect	Back teeth decayed; tops of front worn away	—	—	—	Irregular	—	Fairly normal; microorganisms	Natural	1010 to 1018	Sometimes very acid	None	—	Pale yellow	Usually natural	—	—	—	More infirm each year; symptoms become more marked in winter	—	—	General and nervine tonics, alkaline mixtures; much benefit from liq. am. acet.	(Unpublished.)	62
—	Obstinate discharge from nose	—	—	Healthy	Hæmic bruit in carotids	—	—	Bronchitis	—	—	—	Thickened	—	Habitual constipation	—	Healthy	—	—	—	None	—	—	—	—	—	Bronchitis	Became progressively worse	—	—	Tonics, without benefit	No muscular atrophy. Died 12 years after commencement of disease ('Gaz. Hebd.,' No. 34, 1881.)	63
—	Incessant discharge from nose	—	—	Normal	Pulse 60, regular, easily compressible	—	—	—	—	—	—	Thick	—	—	—	Normal	—	—	—	None	—	—	—	—	—	—	Temporary improvement	—	—	Cod-liver oil, iodide of iron, quinine, strychnia, without benefit; improved under induced current	No muscular atrophy. Muscles responded well to induced current. ('Gaz. Hebd.,' No. 34, 1881.)	64
—	—	—	—	Normal	Hæmic bruit in carotids	—	—	Bronchitis	—	—	—	—	—	—	—	—	—	—	—	None	—	—	—	—	—	Bronchitis	Stationary	—	—	Cod-liver oil, iron, quinine, nux vomica, and induced current without benefit	Chlorosis at 17; inflammation of cervical glands at 20. Muscles responded well to induced current. ('Gaz. Hebd.,' No. 34, 1881.)	65

No.	Observer's name.	Initials of patient.	Age	Sex.	Personal antecedents. Social condition.	Family antecedents	Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.	Bulk.	Weight.	Physiognomy.	State of skin. Face.	Body.	Supraclavicular region.	Vulva.	Extremities.	Nails.	Hair.	State of thyroid, past and present	Temperature. Axillary.	Of surface.	Of internal parts.	Presence of watery dropsy (pitting, ascites).	Sensation. Lost.	Perverted.	Delayed.	Of heat and cold.	Subjective sensations.	Occipital headache
66	Morvan	M. A. L.	50	F.	Wife of a farmer	—	—	—	—	Began at 16, scanty at first	—	9 in 15 years	48	Face	Lower Brittany	—	—	—	—	—	—	—	Hard œdema of legs, feet, and hands	—	—	—	—	—	—	—	No	No	No	—	—	—
67	Morvan	M. J. A.	—	F.	Wife of a farmer	—	—	—	—	Ceased about 83	—	7 in 15 years	35, during lactation	—	Lower Brittany	—	—	—	Swollen	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
68	Morvan	Mme. T.	50	F.	Widow of a farmer	M. A. R. (see above) is a relative	—	Yes	—	—	—	4	—	—	Lower Brittany	Exceedingly stout	—	Face round; features coarse, expressionless	Solid œdema; eyelids swollen, transparent, half closed; nose broad and flat; lips thick and livid	Dry	—	—	Solid œdema; hands and legs misshapen and skin dry	—	—	—	—	—	—	—	—	—	—	—	—
69	Morvan	M. L. T.	—	F.	Wife of a farmer	—	—	—	—	—	—	5; 3 born after onset of myxœdema	22	—	Lower Brittany	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70	Morvan	A. G.	46	F.	—	—	—	—	—	Began at 16, regular and abundant; ceased at 45	—	6 in 22 years; none born since myxœdema	39	—	Lower Brittany	—	—	—	Swollen	—	—	—	Swollen	—	—	—	—	—	—	—	—	—	—	—	—	—
71	Morvan	M. L. L.	40	F.	—	—	—	—	—	Ceased at 35, when swelling came on	—	7 in 11 years; none born since myxœdema	35	—	Lower Brittany	Stout	—	—	Eyelids a little swollen	—	—	—	Legs swollen	—	—	—	—	—	—	—	—	—	—	—	—	—
72	Morvan	R.	40	F.	Wife of a farmer	—	—	—	—	—	—	Several	—	—	Lower Brittany	—	—	—	Swollen	—	—	—	Swollen	—	—	—	—	—	—	No ascites	—	—	—	—	—	—
73	Morvan	M. B	46	F.	—	—	—	—	—	Began at 16; ceased at 43, when swelling came on	—	7 in 27 years	—	—	Lower Brittany	—	—	—	Swollen	—	—	—	Swollen, hard, and cold	—	—	—	—	—	—	—	—	—	—	—	—	—
[illegible]	Morvan	F. B.	43	F.	Farmer's wife	—	—	—	—	Regular; ceased at 35	—	3 to 7 years	38 or 39	—	—	—	—	—	Swollen	—	—	—	Swollen	—	—	—	—	—	—	—	—	—	—	—	—	—
75	Morvan	Q.	50	F.	Farmer's wife	—	—	—	—	—	6	—	39	—	—	—	—	—	Swollen	—	—	—	Swollen	—	—	—	—	—	—	—	—	—	—	—	—	—
76	Morvan	L. B.	68	F.	Farmer's wife	—	—	—	—	Ceased at 43, when last pregnant	—	7	67	—	—	—	—	—	Swollen	—	—	—	Swollen	—	—	—	—	—	—	—	—	—	—	—	—	—
77	Morvan	F. P.	50	M.	—	—	—	No	—	—	—	—	—	Face	—	—	—	Features large, nose flattened	Swollen, especially eyelids	Dry, rough	—	—	Hard œdema of legs and wrists; fingers large	—	—	—	—	—	—	—	—	—	—	—	Vertigo; always cold	
78	Moullin	Mrs. N.	31	F.	Married	—	—	—	—	Regular	—	—	—	—	—	—	—	—	Typical	—	—	—	Hands coarse, rough, without perspiration	—	Falls off	—	96° to 97°	—	—	—	—	—	—	—	None	
79	Myers	J. P.	35	F.	Cook	Mother is said to have died of dropsy at 35, and the patient is said to be growing daily more like her	No	In very small quantities	None	Regular; normal	None; married 4 years	—	33 (weakness and alteration of voice and gait)	Face	Bexley, Kent; for last 4 years near Reigate	—	—	Blunted features, passive expression	Dry, thin, smooth as a rule, clear; a very fine superficial layer is scaling off in parts; flush on tip of nose and cheeks; small ears	Dry, thicker than on face; no scaling	Same as rest of body	— and induration increasing towards periphery, very marked in hands, and most so in ends of fingers. Hands large; no delicacy of moulding	Much roughness from shoulders downwards	Flat, not split or ribbed	Soft and fine, much has fallen out; some fine hair over temples	Has noticed lumps in position of thyroid for at least 20 years. The lobes are now about twice the normal size, widely separated, much hardened and in part calcareous. No connecting isthmus felt. No tenderness or pain, but some choking on swallowing, and trifling impediment to speech referred to cricoid cartilage	96·2° to 99°, average 97·5° (3 weeks' observation)	—	—	None	No	No	No	Good	Occasional chilliness of extremities	
80	Myers	—	30	M.	Bricklayer's labourer	Father died of painters' colic, mother of dropsy; 1 sister died in a confinement, 1 alive healthy and thin (unlike the patient)	Probably 10 yrs. ago	Has drunk much beer	None	—	—	—	28	Lower eyelids	Chiefly London; occasionally does jobs in the provinces	Very short, thickset	—	Expressionless, good-tempered, characteristic	Dry, smooth, flush on cheeks and bridge of nose, baggy folds beneath each eyelid, chiefly right; dry scab, probably the remains of old erysipelas, on right nostril	Dry, a little scurfy, slightly cracked	Full and elastic	—	Hands and feet spade shaped, very cold, purplish, dry, and cracked	Imperfectly nourished, opaque, transverse striæ	Scanty, fine, dry, brittle, used to fall out	Limits not defined, neck being very thick; isthmus about normal, the lobes apparently not abnormal; no past history	Average for 10 days 97°; between 96·8° and 98·8°	—	—	Slight pitting of legs twice; no ascites	Cannot be certain of the number of points touching within half an inch	No	No	—	None	

TABULATED ASES OF MYXŒDEMA—*cont*[d].

Sensation			Motion				Convulsions	Reflexes		Intellectual changes													Circulatory system					Respiratory system	Digestion
Of heat and cold.	Subjective sensations.	Occipital headache.	Paralysis.	Paresis.	Retardation.	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia.	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries		
—	—	—	—	Yes	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow, hoarse, not nasal; pronunciation good	—	—	—	—	—	Normal	Pulse 60, regular, compressible	—	—	—	—
—	—	—	—	—	Yes	—	—	—	—	—	—	Imperfect	—	—	Good	—	—	—	—	—	Slow, hoarse	—	—	—	—	—	Normal	—	—	—	Pneumonia	—
—	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow, hoarse	Eyes bleary, watery	—	Serous discharge from nose	—	—	Normal	—	—	—	Bronchitis	—
—	—	—	—	Yes	—	Frequent stumbles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow, hoarse	—	—	—	—	—	Normal	—	—	—	Pneumonia	—
—	—	—	—	Yes	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow, hoarse	Eyes red and watery	—	—	—	—	Normal	Pulse 56 to 60, feeble, compressible	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A little slow and hoarse	—	—	—	—	—	Normal	Pulse 56, feeble	—	—	—	—
—	—	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow and hoarse	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow, drawling, hoarse	—	—	—	—	—	Normal	—	—	—	—	—
—	—	—	—	—	Yes	—	—	—	—	—	—	—	—	—	Sleeps well, very drowsy in the day	—	—	—	—	—	Slow, hoarse	Eyes watery	—	Discharge from the nose	—	—	Normal	Pulse 64, regular	—	—	—	—
—	—	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow, hoarse	—	—	—	—	—	Normal	—	—	—	—	—
—	—	—	—	—	Yes	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Slow, hoarse	—	—	—	—	—	Normal	Pulse 68, regular	—	—	—	—
—	Vertigo; always cold	—	—	Yes	Yes	—	—	—	—	—	—	Perfection	—	—	—	—	—	—	—	—	Slow, thick, hoarse	Eyes tend to become watery	—	Discharge from the nose	—	—	Normal	Pulse 54, regular, not strong	—	—	—	—
—	None	—	—	—	Yes, takes an hour to do half an hour's work	Has falls	—	—	—	—	—	—	—	Yes, especially from noises	Often sleeps in the day-time	—	—	Bad	—	—	Typical	Good	Impaired	Impaired	Gone	—	—	—	—	—	—	—
Good	Occasional chilliness of extremities	None	None	None	All movements slow	None	None	Greatly diminished in body, but not in face or feet	Slight reflex from patellar and Achilles tendons; none elicited in arms	No	—	No	Good, not altered	None	Never very good. It was often interrupted by lumbar pain	None	None	Good	Absent	Absent	Slow, but clear and accurate, pronunciation slightly staccato, pitch of voice low, and lower, she is told, than it used to be	Myopia, some floating black specks	Good	Good	Good	—	Position normal, action weak	Soft, low, tension	Normal	Congested on nose and cheeks	Normal	Slow; she complains of some obstruction referred to cricoid
—	None	None	None	None	All movements slow	None, no falls	None	About normal	At present patella and triceps if anything in excess	Distinct in manner, action, and perception	Not noticed	Intelligent but uneducated	Never learnt to write	Not noticed	Good	None	None	Good	None	None	Deliberate, but distinct. It has been noticed that his voice has become deeper during the last year or two	Good; conjunctival congestion; pupils normal	Good	—	—	Normal to distinguish on palpation; 1st sound nearly inaudible everywhere; 2nd clear and accentuated	Impulse faint, and difficult on palpation; 1st sound nearly inaudible everywhere; 2nd clear and short, and accentuated	Pulse 50 to 60, regular, very weak; no atheroma	Normal	Congested on face	Respirations 14 to 16; breath sounds feeble	Easy

		Circulatory system.					Respiratory system.	Digestive system.						Lymph glands.	Urinary system.								Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information.	No.
	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defecation.		General state of urine.	Quantity.	Specific gravity.	Re-action.	Albumen.	Urea.	Colour.	Micturition.									
	—	—	Normal	Pulse 60, regular, compressible	—	—	—	—	—	—	Normal	—	—	—	Normal	—	—	—	None	—	—	—	—	—	—	Stationary	—	—	Nux vomica, without benefit	Metritis at 42, after confinement. ('Gaz. Hebd.,' No. 35, 1881.)	66
	—	—	Normal	—	—	—	Pneumonia	—	—	—	—	—	—	—	—	—	—	—	None	—	—	—	—	—	Pneumonia	—	Pneumonia	—	—	Disease began after patient had suckled a child for 2 years. ('Gaz. Hebd.,' No. 35, 1881.	67
as rge nose	—	—	Normal	—	—	—	Bronchitis	—	—	—	—	—	—	—	Normal	—	—	—	None	—	—	—	—	—	Bronchitis	—	Bronchitis	No	—	Died of bronchitis at 60. ('Gaz. Hebd.,' No. 35, 1881.	68
	—	—	Normal	—	—	—	Pneumonia	—	—	—	—	—	Obstinate constipation	—	—	—	—	—	None	—	—	—	—	—	Pneumonia	—	Pneumonia	—	—	Died of pneumonia at 49. Was exposed to cold a week after child-birth. The next day she was swollen, and continued so until her death. ('Gaz. Hebd.,' No. 35, 1881.)	69
	—	—	Normal	Pulse 56 to 80, feeble, compressible	—	—	—	—	—	—	—	—	—	—	Normal	—	—	—	None	—	—	—	—	—	—	—	—	—	—	Symptoms dated from hæmorrhage after an operation. ('Gaz. Hebd.,' No. 35, 1881.)	70
	—	—	Normal	Pulse 56, feeble	—	—	—	—	—	—	—	—	Constipation	—	Normal	—	—	—	None	—	—	—	—	—	—	—	—	—	Nux vomica, without result	('Gaz. Hebd.,' No. 35, 1881.)	71
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Was seen alive 20 years later. ('Gaz. Hebd.,' No. 35, 1881.)	72
	—	—	Normal	—	—	—	—	—	—	—	—	—	—	—	Normal	—	—	—	None	—	—	—	—	—	—	—	—	—	Nux vomica, without result	Had a temporary swelling of body after birth of third child. ('Gaz. Hebd.,' No. 35, 1881.)	73
rge the	—	—	Normal	Pulse 64, regular	—	—	—	—	—	—	—	—	Constipation	—	Healthy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Suckled her last child for more than 2 years. Symptoms came on 3 years later. Dribbling of saliva. ('Gaz. Hebd.,' No. 35, 1881.)	74
	—	—	Normal	—	—	—	—	—	—	—	—	—	—	—	Healthy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	('Gaz. Hebd.,' No. 35, 1881.)	75
	—	—	Normal	Pulse 68, regular	—	—	—	—	—	—	—	—	—	—	Healthy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	('Gaz. Hebd.,' No. 35, 1881.)	76
rge be	—	—	Normal	Pulse 64, regular, not strong	—	—	—	—	—	—	—	—	Habitual constipation	—	Clear	Abundant	—	—	None	—	—	—	—	—	—	—	—	—	—	Strychnia; result not known	('Gaz. Hebd.,' No. 35 1881.)	77
ed	Gone	—	—	—	—	—	—	—	Fairly good	—	—	—	—	—	—	—	1012	—	None	—	—	—	—	—	—	—	—	—	—	—	From Dr. Ord's notes. ('Lancet,' 1881.)	78
l	Good	—	Positive normal, action weak	Soft, low, tension	Normal	Congested on nose and cheeks	Normal	Slow; she complains of some obstruction referred to cricoid	Much decayed	—	Pale, large, flabby, indented, clean	Pale, large, uvula; soft, palate pale, otherwise normal	Regular and normal	Normal	Slight mucous deposit	2 pints a day on an average	1010 to 1015	Faintly acid	Slight trace once. Absent on many other observations	—	Pale	Not frequent; normal	—	None	—	No change	—	—	Empl. Belladonnæ applied to region of right kidney, where there was constant dull pain, without marked effect	(Unpublished.)	79
	—	Normal to distinguish on palpation; 1st sound nearly inaudible everywhere; 2nd clear and accentuated	Impulse faint, and difficult	Pulse 50 to 60, regular, very weak; no atheroma	Normal	Congested on face	Respirations 14 to 16; breath sounds feeble	Easy	Slightly decayed	Fairly healthy	Thick, pointed, clean	—	Normal	Normal	Slightly turbid with mucus	Normal or slightly in excess	1010 to 1016, sub-normal	Acid	In 4 trials out of 5 a very faint trace with picric acid, and with heat and acetic acid; generally easily soluble in nitric acid	Not estimated	Pale	Rather frequent	Normal	None	—	Slow during last 2 years	—	—	—	(Unpublished.)	80

No.	Observer's name.	Initials of patient	Age.	Sex.	Social condition.	Personal antecedents. Family antecedents.	Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.	Bulk.	Weight.	Physiognomy.	State of skin. Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.	Nails.	Hair.	State of thyroid, past and present.	Temperature. Axillary.	Of surface.	Of internal parts.	Presence of watery dropsy (pitting, ascites).	Sensation. Lost.	Perverted.	Delayed.	Of heat and cold.	Subjective sensations	Other symptoms
81	Naven	—	66	F.	Husband a cook	Unknown	No	No	—	Natural before climacteric	None	—	66	—	Isle of Thanet, Ramsgate, and Broadstairs	Great	—	Heavy, dull, sad	Rough, harsh, pale, with dull flush on each cheek	Scaly	—	—	Very rough and scaly; hands large and clumsy	—	Thin and grey	—	—	—	—	—	—	Yes	—	—	
82	Oliver	S. C.	52	F.	Married	Father died from sequelæ of fistula in ano; mother died suddenly; heart, lungs, and kidneys found diseased post mortem	No	No	No	Regular up to 2½ years ago, when they ceased	10, 2 being miscarriages	8; 7 alive (youngest 13) and very well	47	Inside throat. Thought the "swallow was becoming less"	North Shields until 10 years ago; afterwards near Sunderland	Very bulky at first, less so now	12 st., 3 years ago; about that now	Heavy, expressionless	Cold, soft, œdematous-looking; no pitting on pressure; tissues under chin and lower lip most bulky	Harsh and dry	Puffy	—	Harsh, dry, cold, and thick, especially at ends of fingers	Hard and thick; used to break off like glass	Very thin, soft, never been harsh	Not well defined, left lobe and isthmus not felt; over right ill-defined fulness and tenderness on pressure	96·5° to 97·5°	—	—	None	—	—	Yes	Feels heat fairly well, bears cold badly	Creeping sensation on face, chiefly round mouth	See ache occi regio cons
83	Oliver	W.	45	F.	Widow	Father died at 48 of stonemasons' phthisis; mother died at 81	Strong suspicion, ascribes her illness to disease contracted from husband	No	—	Regular until husband's death 3 years ago, since then ceased	None	None	42	Round and under the eyes	Always in Newcastle-on-Tyne	Rather stout some time ago; is getting thinner	—	Expressionless and dull	Soft, cold, translucent around eyes	Harsh and dry	Rather full	—	Harsh and dry, extremely coarse over backs of hands	Healthy, grow very quickly	Fairly soft, comes out easily, but growing again	Apparently cannot be felt	95·4° to 97°	—	—	—	No	No	Yes	Heat not easily felt, cold felt readily and borne badly	Creeping sensations in both hands, pain under nails, running up hand, especially at night	Ha hea in occ reg also cons tion ing brow occ
84	Ord	Mrs. G.	(32 now 35)	F.	Good	—	—	—	—	Absent since birth of last child (5 years ago), which she did not suckle	—	6; 5 living	28	—	—	—	—	—	—	Dry, but not rough; has perspired lately in hot weather	—	—	—	Not affected when first seen (July, 1881), but began to fall off a year later	—	99·4° (after a journey)	—	—	—	—	—	—	—	Pains in back; feels the cold much	
85	Ord	Mrs. M.	40	F.	Married, middle class	Good	No	No	No	Irregular, intervals too long	—	7; all living; 5 born before swelling appeared (not suckled), 2 afterwards	31	General	Born in Germany; lived many years in Glasgow	Much increased	—	Characteristic	Characteristic	Characteristic	Full	Not examined	Characteristic	Not noticeably affected	Not noticeably affected	Small; no history of enlargement	—	—	Mouth 98·9° (one observation)	None at present, said to have occurred in legs	No change observed	No change observed	No change observed	—	Sweetish taste in mouth; occasional giddiness; feels cold acutely	
86	Ord	T. S.	—	F.	Poor	Father died of phthisis	No	No	No	—	—	—	10 years before admission	Face, especially eyelids	—	—	—	—	Harsh	Harsh	—	—	Very harsh	—	—	—	Low, only once as high as 98·6°, lowest 95·8° a.m., 93·4°; average 96·4° p.m.	—	—	Œdema of legs	—	—	—	—	—	Yes, vom
87	Ord	H.	42	M.	Railway clerk	Father and mother died of old age, both 74; 2 aunts died of rapid consumption	No	No	No	—	—	—	39	—	Kennington	—	—	Aspect dull, but anxious	Dry, wrinkled on forehead and scalp, complexion waxy, except over top of nose and malar bones, both these spots being ruddy; lips prominent and swollen; loss of curves of mouth; nostrils dilated and fixed; ears prominent, away from skull	—	—	—	Hands cold, harsh, dry; no œdema of legs	—	Scanty, especially on vertex, thin and lank; whiskers similar	—	—	—	Mouth 97·6°	—	—	Impaired in hands	—	—	
88	Ord	Miss M.	42	F.	—	—	—	—	—	Excessive	—	—	—	—	—	—	—	Characteristic	—	—	Lumps felt	—	Hands rough	—	—	Small	97·5°	—	—	—	—	—	—	—	None	
89	Ord	Mrs. P.	35	F.	—	—	—	—	—	Regular; dysmenorrhœa, menorrhagia	None	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
90	Ord	Mrs. T.	36	F.	—	—	—	—	—	—	—	2; married 4½ years	34	Eyelids	Aberdeenshire	—	—	Charscteristic	—	Dry	Lumps found	—	—	—	—	—	—	—	—	—	—	—	—	—	Feels the cold; nasty taste in the mouth	
91	Ord	Mrs. B.	28	F.	—	—	—	—	—	—	—	2; married 5 years	—	Neck, body, arms, face, legs (in order)	—	—	—	—	Characteristic	Hard and drum-like	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

TABULATED CASES OF MYXŒDEMA—*cont.*

Subjective sensations.	Occipital headache.	Motion.				Convulsions.	Reflexes.		Intellectual changes.													Circulatory system.					Respiratory system.	Digestion.	
		Paralysis.	Paresis.	Retardation.	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia.	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		
—	—	—	—	Yes	—	No	—	—	Yes	—	Perfection	—	—	—	No	No	Good	No	—	Slow, gruff, hoarse	Blindness an early symptom	Slow and very defective	—	—	—	—	—	—	—	—	
Creeping sensation on face, chiefly round mouth	Sort of aching in occipital region, not constant	None	Slight at first, now gone	Yes, formerly very quick in walking, then slow	Very marked, at first staggered greatly; has fallen frequently, but has never hurt herself	None	—	—	Yes	—	If put out in any way is long in recovering	(Specimen given)	Not at all. Very even tempered, hasty when young	Sleeps well	None	None	Impaired (improving). When she rose from the table she used to forget what she rose for	None	—	Thick and slow.	Eyes "water" a good deal when out in the cold	Thinks hearing has always been slightly dull	Smell normal, nose not so thick as formerly. Troubled by trickling of clear water down nostril	Bad in the morning	—	2nd sound accentuated and re-duplicated	Slightly hard, but compressible; pulse 72	—	Dilated on face	Healthy	Good	
Creeping sensations in both hands, pain under nails, running up hand, especially at night	Heavy headache in occipital region; also cord constriction passing round brow and occiput	None	Yes; frequently lets things fall	Yes	Yes; has fallen frequently	None	—	Retarded knee-jerk	Yes	No	—	Never could write	Very irritable now; not so formerly	Very fair	No	No	Very forgetful	No	Shuns all public gatherings. Extremely nervous in the street and afraid of being knocked over	Thick and slow	Bad; left pupil responds more quickly to light than right	Imperfect	Not good	Cannot taste things as formerly. Does not think they taste well. Saliva flows from mouth when asleep	—	Reduplicated 1st sound	Felt with difficulty, pulse 58 and 60	—	—	Well-marked interruption between inspiration and expiration	Good	
Pains in back; feels the cold much	Yes	—	Knees give way	Yes, takes an hour to dress, formerly half an hour	Slow with fingers; drops things	—	—	—	Slow thoughts	—	—	—	Yes	—	—	—	Impaired	—	—	Slow, imperfect, monotonous	Impaired	Impaired	Impaired	Impaired	—	No hypertrophy	—	—	—	No lung affection	—	
Sweetish taste in mouth; occasional giddiness; feels cold acutely	No	None	None	Yes	No; no falls	No	Not examined	Knee-jerk obtained; not strong	Marked	Not marked	Mental processes perfect	Unaltered, writes long letters	Slight	Good	None	None	Failure at times	No	No	Distinct slowness with little change of quality of voice	Good	Occasionally deaf, otherwise good	No affection of smell; polypus in right nostril	Good	Not examined	Normal	No evident change	—	Blush on cheek very marked, but complexion said to have been extremely ruddy	Nothing notable	—	
—	Yes, with vomiting	—	—	—	—	—	—	—	—	—	—	—	Yes	—	Decided	—	—	—	—	Slow, deliberate, but no lack of words	—	—	—	—	—	No murmur; 2nd sound reduplicated at apex, 1st sound weak at base	Pulse 80	—	Dilated on cheeks, forming characteristic blush	—	Slight difficulty in swallowing	
—	—	—	—	Slow in all movements; has to be assisted in dressing	Gait tottering, afraid of being pushed down; tends to fall forwards; has to be supported; can pick up a pin, but with some difficulty	—	—	Patellar reflex faint	—	—	—	Writes fairly	—	—	—	—	—	—	—	Slow, unmusical, intonation nasal, the explosive "p" becoming the dull "h"	—	—	—	—	—	Sounds strong, ? accentuated, no murmur	Pulse 84	—	—	—	No difficulty. Food does not accumulate in buccal cavity	
None	—	—	—	"Fingers all thumbs"	No falls	—	—	Patellar reflex good	—	—	—	—	Yes	Drowsy all day, sleeps well at night	Is suspicious	—	Not affected	—	—	Characteristic	Imperfect	Imperfect	—	—	—	Mitral disease	—	—	—	—	Some difficulty	
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Feels the cold; nasty taste in the mouth	—	—	—	Yes	Tumbles about; is awkward	—	—	Patellar reflex (?) exaggerated	—	—	—	—	Yes	—	Yes, and suspicious	—	Bad	—	—	—	—	—	—	—	—	Normal	—	—	—	—	—	
—	—	—	—	—	—	—	—	—	—	—	No loss of intellect	—	—	—	—	—	Good	—	—	No marked change	—	—	—	—	—	—	—	—	—	—	

			Circulatory system.					Respiratory system.	Digestive system.						Lymph glands.	Urinary system.								Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect[1]	Additional information.	No.
ars and earing	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defecation.		General state of urine.	Quantity.	Specific gravity.	Re-action.	Albumen.	Urea.	Colour.	Micturition.								
ow and very defective	—	—	—	—	—	—	—	—	—	Good	—	—	—	—	—	—	—	—	—	None	—	—	—	Had been natural	—	—	Gradual failure of power of circulation	The arm sloughed 40 days before death; died exhausted, aged 76	—	Palliative; no effect	(Unpublished.)	81
ks hearg has ys been tly dull	Smell normal, nose not so thick as formerly. Troubled by trickling of clear water down nostril	Bad in the morning	—	2nd sound accentuated and re-duplicated	Slightly hard, but compressible; pulse 72	—	Dilated on face	Healthy	Good	Good, 12 left	Rather retracted and pale	Clean, slightly enlarged	Tonsils enlarged, pale, and oedematous looking	Easy	Healthy	—	—	—	—	—	—	—	Easy, frequent, especially if "put out of the way"	—	—	—	—	—	Much improved as regards staggering and other nervous symptoms since taking hydrarg. perchlor., iod. of potassium, and pil. phosph.	Feels compelled to carry out into action anything she thinks absurd. ('Brit. Med. Journ.,' March 17th, 1883.)	82
perfect	Not good	Cannot taste things as formerly. Does not think they taste well, Saliva taste too sweet. Flows from mouth when asleep	—	Reduplicated 1st sound	Felt with difficulty, pulse 58 and 60	—	—	Well-marked interruption between inspiration and expiration	Good	Good, but loose	Pale, soft, lumpy	Large and clean	—	Easy, formerly had pain	Apparently healthy	Healthy	—	1012 to 1015	Acid	None	—	Light straw	Easy	—	—	—	—	—	—	Tinct. of jaborandi, iron, quinine, liq. hydrarg. perchlor., pot. iod. pil. phosph., tried without effect	Queer feelings after marriage, partly dreamy, during which she imagined she was being blown up like a balloon. ('Brit. Med. Journ.,' March 17th, 1883.	83
paired	Impaired	Impaired	—	No hypertrophy	—	—	—	No lung affection	—	Went early	—	Not swollen	Swollen	—	—	—	—	—	—	None	—	—	—	—	—	—	—	—	—	Tinct. jaborandi for 18 months in doses increasing from 30 to 90 m. Lost a great part of her swelling and associated troubles	(Unpublished.)	84
sionally other- good	No affection of smell; polypus in right nostril	Good	Not examined	Normal	No evident change	—	Blush on cheek very marked, but complexion said to have been extremely ruddy	Nothing notable	—	Healthy	—	—	Somewhat swollen	—	—	Urine not obtained, but said to have been examined several times and found healthy	—	—	—	—	—	—	—	—	—	Disease is said to have disappeared completely on two occasions during pregnancy, and to have returned after confinement	—	—	—	—	(Unpublished.)	85
—	—	—	—	No murmur; 2nd sound reduplicated at apex, 1st sound weak at base	Pulse 80	—	Dilated on cheeks, forming characteristic blush	—	Slight difficulty in swallowing	—	—	Large, clean	Palate and tonsils indurated	—	—	—	—	1018	—	Trace	—	—	—	—	—	—	—	—	—	(Unpublished.)	86
—	—	—	—	Sounds strong, ? accentuated, no murmur	Pulse 84	—	—	—	No difficulty. Food does not accumulate in buccal cavity	Front teeth gone	—	Swollen, apparently too large for mouth; epithelium denuded on right side	—	Bowels regular, but tendency to constipation	—	—	Normal, or, if anything, a deficiency	—	—	—	—	—	—	—	—	—	—	—	—	Has frequent faints. Swelling at back of neck over trapezius so that he cannot bear to wear a collar. (Unpublished.)	87
erfect	—	—	—	Mitral disease	—	—	—	—	Some difficulty	—	—	—	—	Bowels regular	—	—	—	1018	—	None when first seen Oct., '81; a trace later	—	—	—	—	—	—	—	—	—	Jaborandi; great improvement	Sunstroke in 1881, since when she has felt her "brain weakened." Has had acute rheumatism three times in last 20 years. Has occasional epistaxis. (Unpublished.)	88
-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	None	—	—	—	—	—	—	—	—	—	Iron	(Unpublished.)	89
-	—	—	—	Normal	—	—	—	—	—	—	—	—	—	—	—	—	—	1009	—	None	—	—	—	—	—	—	—	—	—	—	Slight attack of acute rheumatism once. (Unpublished.)	90
-	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Jaborandi	Illness attributed to taking arsenic. (Unpublished.)	91

No.	Observer's name.	Initials of patient.	Age.	Sex.	Social condition.	Family antecedents.	Personal antecedents.									Bulk.	Weight.	Physiognomy.	State of skin.					Nails.	Hair.	State of thyroid, past and present.	Temperature.			Presence of watery dropsy (pitting, ascites).	Sensation.				Subjective sensations.
							Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.				Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.				Axillary.	Of surface.	Of internal parts.		Lost.	Perverted.	Delayed.	Of heat and cold.	
92	Ord	E. C.	53	F.	Married; lower classes	Father and mother died of "dropsy;" 1 brother "dropsical"	—	—	—	—	4, one a miscarriage	3	51	Chest	Rotherhithe	Stout	—	Dull, placid	Puffed, dry, glossy, red flush on cheeks	Dry, rough, desquamating	—	—	Dry, rough, desquamating; hands swollen, skin smooth and dry; fingers cannot be bent owing to tension of skin	—	Dry, comes out	—	Often subnormal, lowest 96°, highest 99·2°	—	—	Very slight pitting of trunk and arms, œdema of ankles	—	—	Yes, in legs and arms	—	Sensations as if hot and cold water were being poured over her
93	Ord	E. W.	57	F.	Widow; lower classes	Father and mother dead; 2 brothers died in a decline; 3 brothers and 1 sister alive and healthy	?	—	—	—	—	5; 1 died of chest affection	—	—	Shropshire, Liverpool, and London	—	—	—	Capillaries dilated on cheeks, eyelids swollen, skin of forehead wrinkled, eyebrows elevated, alæ nasi thickened, lips thick and blue	—	—	—	Hands thick, clumsy, scaly; feet rather swollen, scaly	Tips turned inwards	Dry	—	Usually 1° to 3°, subnormal; varies from 95° to 99·4°	—	—	None	—	—	—	—	—
94	Ord	A. P.	60	F.	Widow; lower classes 1 sister died at 42	Father died of dropsy at 59, mother of apoplexy; 1 brother subject to rheumatism; of heart disease at 42	—	—	—	Regular	6	4; 1 son died of phthisis	57	Legs	Brentwood	—	—	Features somewhat obliterated, expressionless	Pale, except for limited flush on cheeks; eyelids puffy, nose and lips large	Dry and scurfy on chest and abdomen	Fulness	—	Feet and legs very puffy, pit slightly. Skin pink about toes, mottled pink and white on dorsum, dry and scaly over legs; hands puffy and skin of dorsum very shiny and pinkish, cracked in some places; arms rough and scaly	—	—	Hard, not enlarged	Always subnormal, 94·4° to 98°	—	—	No ascites; slight pitting of legs and feet	—	—	—	—	Numbness of fingers, salt taste in mouth, trickling down back, always cold
95	Ord	S. M.	52	F.	Lower classes	Father died at 60 of rheumatism, mother at 60 of bronchitis	No	No	No	Scanty, and at long intervals	6, including 1 miscarriage	5	—	Belly	Walworth, London	—	—	Heavy	Flush on cheeks, lips blue and puffy, skin puffy and glazed	Dry and scurfy	—	—	Dry, scurfy, veins distended, extremities blue	—	Scanty	Very small	Highest 99·8°, lowest 77° (just before death)	—	—	—	—	—	—	—	Feeling of cold
96	Ord and Hurley	H. D.	35	F.	Lower classes	Good	No	No	—	Absent for a year; appeared again under treatment	—	—	27, after birth of child	Eyelids, feet, abdomen	Vauxhall, London	Well nourished	—	Dull, stolid	Puffy, waxy, not œdematous, flush on malar bones	No perspiration	—	—	Harsh on hands, like a coarse scaly fish	—	—	Greatly atrophied, no previous enlargement	Low, highest 99°, lowest 94·4°, average 96° a.m., 97° p.m.	—	—	—	No	No	No	—	—
97	Pye-Smith	—	50	F.	Widow for last 5 years; 1 brother died of morbus cordis, 1 is dropsical, 1 has gout, 1 well	Father alive, æt. 84; mother died, æt. 82, dropsical	No	Probably no excess	None	Absent since last confinement at the age of 35 every appearance of going like her mother; none since establishment of myxœdema	8, no miscarriages ½ years; 1 has	1 died at birth; 1 of fits, and 1 of cough, both under	About 44; was under Dr. Fagge for dropsy, but the urine was healthy	Hands, then arms, face, ankles, legs, thighs	—	Very unwieldy	15 st. (7 st. at 19)	Characteristic	Smooth, soft, and injected cheeks, otherwise somewhat pale	Moveable and not thickened	No lumps of fat to be felt	—	Smooth, moveable, not adherent to subjacent tissues	—	Black, with some grey hairs, scanty and dry, not coarse, absent on forehead and sinciput	Not to be felt	—	Habitually subnormal, 97·8°, 96°; never above 98°	—	None; acupuncture of eyelids, but no serum came away	Apparently unaffected	Apparently unaffected	Apparently unaffected	Apparently unaffected	Always feels cold, and suffers much in winter
98	Roberts	—	50	F.	Unmarried, housekeeper father died at 81 of unknown cause, mother of pneumonia at 70; 2 sisters and 4 brothers living; 1 brother dead	Grandparents lived to be over 70 and some over 80;	—	—	—	Regular since 13; now becoming irregular	—	—	—	Periodic swellings of feet, legs, hands, and arms for 24 or 36 hours, with scantiness of urine	—	—	—	Expressionless	Two warty growths on eyelids; puffiness of face with a peculiar pallor	—	—	—	Hands puffy; joints of fingers enlarged; 2 or 3 warty growths on arms	—	Quite bald on top of head; hair of entire scalp very sparse of late; hair of eyebrows, eyelashes, pubes, and axillæ nearly gone	—	Normal in left axilla; 1·5° below normal in right	—	Normal in mouth	No pitting	A needle could be thrust into her body without wincing	—	—	—	Sensation of a multitude of small insects crawling over her; pain at extreme end of spine and tenderness over mid-dorsal and cervical regions
99	Sanders	—	44	M.	Pauper	Mother died of phthisis	No history	A free drinker at times	—	—	—	None	38	Lower eyelids	Hackney; born at Norwich; now in Bethnal Green Infirmary	Good	11 st. 3½ lbs.	Dull and apathetic	Puffy	Small scales on body	Full	—	Hands spade-like; legs covered with scales	Ridged	Alopecia at back of head	Not to be felt	—	98·4°	—	None	No	No	No	—	Of heat and cold at times
100	Savage	S. D.	50	M.	Lower orders, formerly a cavalry soldier	—	—	No	Sunstroke in India in 1848	—	—	—	49½	—	—	—	13 st. 3 lbs.	—	Puffy, deeply wrinkled	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
101	Semon	—	56	F.	Lower middle class	Both parents died of old age, 1 brother at 46 from consumption	No	No	No	Regular up to 52	21 (7 miscarriages)	14 alive, none born after establishment of myxœdema	About 35	Face	London	Stout	—	Quiet, placid expression	Unhealthy, yellowish-white, œdematous-looking; sharply-defined red spots on cheeks, only appear on emotional troubles	Dry, parched, brittle, peels off in scales	—	—	Hands often purple coloured	Purple	Has come off everywhere on her body (head, eyebrows, eyelids, axillæ, pubes, &c.)	No trace of thyroid; no history of preceding goître	97·1° on both sides (repeatedly taken)	—	—	No	No	No	Yes	—	Always cold, and fingers of right hand numb; deep-seated pains with roaring of waves in ears

TABULATED CASES OF MYXŒDEMA—*cont.*

ion.				Motion.				Convulsions.	Reflexes.		Intellectual changes.													Circulatory system.					Respiratory system.	Degintition.
elayed.	Of heat and cold.	Subjective sensations.	Occipital headache.	Paralysis.	Parcsis.	Retardation.	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia	Changes in speech.	Eyes and vision.	Ears and hearing	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		
Yes, in gs and arms	—	Sensations as if hot and cold water were being poured over her	—	—	Of legs, not of arms	—	—	—	Plantar reflex well marked	Patellar reflex slightly marked	—	—	—	—	—	Good	—	—	—	—	—	Slow, deliberate, distinct	Conjunctivæ watery	Good	—	—	—	Normal	—	—	Dilated on cheeks	Normal	—
—	—	—	—	—	—	—	—	—	—	—	—	Persistent in talking	Forgets words when she is writing	Writes slowly	—	—	—	—	—	—	—	Slow, thick, hesitating	Conjunctivæ pale, sight dim. Occasional diplopia. Floating objects before the eyes	Impaired	—	—	—	No murmur, 1st sound reduplicated	—	—	—	Some bronchitis	Some difficulty
—	—	Numbness of fingers, salt taste in mouth, trickling down back, always cold	No	—	—	Yes, marked	—	—	—	—	—	—	—	—	—	Sleeps badly	—	—	Impaired	—	—	Thick, not very slow	Eyes watery, sight not good	Deaf on both sides	—	—	—	2nd sound reduplicated at apex and base	Pulse 54, fairly full, not compressible	—	—	Normal	—
—	—	Feeling of cold	No	—	Dropping of chin on sternum	Slow and deliberate	Staggering gait like a drunkard	—	—	—	—	—	—	—	—	—	—	—	Defective	—	—	Slow, deliberate, indistinct, leathery	Good	Good	Good	—	—	1st sound feeble, 2nd accentuated	Pulse 42, feeble, regular	—	Dilated on cheeks	Bronchitis	—
No	—	—	—	—	—	Marked; takes her twice as long to dress as formerly	Cannot sew, as fingers are clumsy	—	—	Patellar reflex equal on both sides	Yes	—	Imperfection	—	—	Bad	Yes	—	—	Much despondency	—	Harsh, hoarse, vocabulary, not deficient	Impaired	—	—	—	—	Sounds weak, no bruit	—	—	Dilated on cheeks	Slight bronchitis	—
ppa-ently un-ected	Apparently unaffected	Always feels cold, and suffers much in winter	Abscut	Absent	Absent	Movements slow; habitually torpid and weak in locomotion	None	None	—	—	—	—	—	—	—	—	—	—	Not so good as it was	—	—	Characteristically slow and deliberate; somewhat husky; quite distinct	Contracted pupils; presbyopia; cannot see well within 2 inches	Decidedly hard of hearing	—	—	Corpuscular richness, 3,330,000 per cubic mm.; no leukæmia	Normal	Somewhat high tension; slight intermission occasionally after coughing	Dilated on cheeks	Dilated on cheeks	Occasional winter cough; lungs normal	—
—	—	Sensation of a multitude of small insects crawling over her; pain at extreme end of spine and tenderness over mid-dorsal and cervical regions	—	—	Marked loss of muscular power	Gait shuffling, with head inclined forwards	—	—	—	—	—	—	—	—	Extreme	Bad, very wakeful	—	—	Very defective, especially for recent events	Sudden impulses to do something desperate; tried to stab a man once	—	Slow, muffled, swollen-lipped character	Variable	—	—	—	—	—	—	—	—	—
No	—	Of heat and cold at times	Present	None	None	Yes	None	None	Good	Good	—	No	—	(Specimen given)	—	Fair	None	None	Good	None	None	Slower than natural, thick	Hypermetropic	Defective on right side	Good	Good	Normal	Slight accentuation of 2nd sound	Good	Good	Good	Normal	—
—	—	—	—	—	—	—	—	—	—	—	—	—	Dulness of perception	—	—	—	Yes, at time of observation	Of sight and hearing, worse at night	—	Yes, but clean, tidy, and easily controlled	—	Loquacious	—	—	—	—	—	—	—	—	—	—
Yes	—	Always cold, and fingers of right hand numb; deep-seated pains with roaring of waves in ears	Very much developed, the first symptom	None	None	Greatly developed	No inco-ordination; often fell, always forward, without warning	None	—	Patellar reflex present	Yes	Not so much observed	Slow, otherwise unimpaired	—	Much	Bad, fearful dreams	—	—	Has suffered somewhat	Was afraid she would jump out of the window or do something formidable	Present at an early period	Much slower, nasal	No change	No change	No change	Impression slow	— at apex and base; some dilatation of right side	1st sound at apex reduplicated; 2nd a little accentuated	No unusual tension; pulse about 62	Nothing abnormal	Nothing abnormal	Lungs healthy	Somewhat difficult, but bougie 20 easily introduced

			Circulatory system					Respiratory system.	Digestive system.						Lymph glands.	Urinary system.							Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information	
rs and earing	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defecation.		General state of urine.	Quantity.	Specific gravity.	Re-action.	Albumen.	Urea.	Colour.	Micturition.								
Good	—	—	—	Normal	—	—	Dilated on cheeks	Normal	—	—	—	Flabby, not furred	—	—	—	Sugar 12 gr. to the ounce when estimated once; uric acid	23 to 63 ounces	1025 to 1040	Acid	Trace	About 250 grammes per diem on an average (about 10 examinations)	Light	—	—	—	Glycosuria	Some improvement	—	—	Apparent improvement under jaborandi	Since dead. ('St. Thomas's Hospital Medical Reports' for 1866.)	92
paired	—	—	—	No murmur, 1st sound re-duplicated	—	—	—	Some bronchitis	Some difficulty	—	—	Large, clean	Swollen, especially uvula	Constipation	—	—	19 to 48 oz.	—	—	None	—	—	—	—	—	Bronchitis	Slight improvement	—	—	—	('St. Thomas's Hospital Medical Notes' for 1866.)	93
on both sides	—	—	—	2nd sound reduplicated at apex and base	Pulse 54, fairly full, not compressible	—	—	Normal	—	—	—	Marked by teeth	—	Constipation, occasional diarrhœa	—	Mucus, oxalate of lime and indigo	20 to 61 oz.	1009 to 1026	—	Trace occasionally	—	Pale	—	—	—	—	—	—	—	Fatty tumour in right gluteal region for 10 years. Rheumatic pains for 5 years. ('St. Thomas's Hospital Medical Notes' for 1879.)	94
ood	Good	—	—	1st sound feeble, 2nd accentuated	Pulse 42, feeble, regular	—	Dilated on cheeks	Bronchitis	—	—	—	Pale, indented, moist, clean	—	Bowels regular	—	Oxalate of lime crystals	Average, 45 oz.	—	—	Trace	—	Turbid	—	—	—	Bronchitis	—	Coma	—	—	Slight delirium and drowsiness before death. ('St. Thomas's Hosp. Reports,' 1879, and 'Clin. Soc. Trans.,' vol. xii.)	95
—	—	—	—	Sounds weak, no bruit	—	—	Dilated on cheeks	Slight bronchitis	—	—	—	—	—	Constipation	—	Mucus, phosphates	Scanty, 4 to 48 oz., average 28 oz.	—	Acid and alkaline	Trace once	66 to 196 gr.	—	—	—	—	Bronchitis	—	—	—	—	Subsequently died. ('St. Thomas's Hosp. Reports,' 1881, and 'Med.-Chir. Trans.,' 1884.)	96
ddedly ed of ering	—	—	Corpuscular richness, 3,330,000 per cubic mm.; no leukæmia	Normal	Somewhat high tension; slight intermission occasionally after coughing	Dilated on cheeks	Dilated on cheeks	Occasional winter cough; lungs normal	—	Fairly good	—	Not apparently swollen, but feels too large	Thickened submucous tissue; she feels "all the throat stuffed up"	Habitual constipation	Not enlarged	Practically healthy, no sugar; trace of proteids occasionally	Sub-normal; usually under 40 oz. daily (she drinks little);	Usually between 1010 and 1015	Acid	Never present 1 per cent., usually 1·5 to 2 Towards end of stay in hospital about 2 per cent.	Occasionally under	Normal	Normal	—	None	None	Improved under rest, food, and laxatives	—	—	Chiefly laxatives; pilocarpin injections were of no benefit	Habitually giddy on rising; more much vertigo or discomfort later in the day; appetite [illegible], no thirst. (Unpublished.	97
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No evidence of kidney disease after several chemical and microscopical examinations	36 oz. on an average	—	—	—	—	—	—	—	—	—	—	—	—	Sodæ bromid., gr. x, t. d. s.; occasional tonics; galvanism to spine three times a week; improvement	A piece of skin was removed and examined. The walls of vessels were thickened, the sweat glands atrophied, and in places surrounded by embryonic cells; the hair follicles normal. Branched cells like connective-tissue cells in serum. ('Planet' (U.S.), Oct. 15th, 1883.)	98
ive on side	Good	Good	Normal	Slight accentuation of 2nd sound	Good	Good	Good	Normal	—	Worn	Good	Broad, not indented	—	Normal	None enlarged	Fair	36 oz.	1014	Acid	None	—	Pale	Normal	Sensual feelings	None	None	Very slow	—	—	Liq. strychnia; no improvement	(Unpublished.)	99
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1015	—	None	—	—	—	—	—	—	—	—	—	—	Inmate of Bethlem Hospital. (Unpublished.)	100
nange	No change	Impression slow	—	1st sound at apex reduplicated; 2nd a little accentuated at apex and base; some dilatation of right side	No unusual tension; pulse about 62	Nothing abnormal	Nothing abnormal	Lungs healthy	Somewhat difficult, but bougie 20 easily introduced	Only a few left, and those decayed and loose	Anæmic, swollen, often inflamed; bleed easily	Pain in right half	Uvula very long, œdematous-looking; soft palate and pharynx very anæmic	Nothing particular	—	Much mucus, epithelial cells; a few red and white blood-corpuscles	—	1010 to 1014	Slightly acid	Occasionally a very slight trace	—	Pale	Easy	Change of life passed	Falls forward without warning	—	Hardly any change for 4 years	—	—	Iodide of potassium in very large doses temporarily relieved the occipital headache. Jaborandi and nitro-glycerine had no effect	('Clin. Soc. Trans.,' vol. xv.)	101

No.	Observer's name.	Initials of patient	Age.	Sex.	Social condition.	Family antecedents.	Personal antecedents.								Bulk.	Weight.	Physiognomy.	State of skin.					Nails.	Hair.	State of thyroid, past and present.	Temperature.			Presence of watery dropsy (pitting, ascites).	Sensation.				Muscular sensations.	Muscular sensations.
							Syphilis.	Alcohol.	Mental disturbance.	Catamenia.	Pregnancies.	Children.	Age at which symptoms first noted.	Part of body in which œdema first observed.	Residence, past and present.				Face.	Body.	Supra-clavicular region.	Vulva.	Extremities.				Axillary.	Of surface.	Of internal parts.		Lost	Perverted.	Dimmed.	Of heat and cold.		
102	Stone	S. C.	86	F.	Lower classes	Father died of cause unknown; mother of fits at 76. Patient is the youngest of 21 children; a brother and a sister only alive	No	—	—	Regular, profuse	8; 1 being a miscarriage 2 years ago	7; 3 alive	35½	—	London	Fat	—	Cretinoid	Puffy, especially lower eyelids; nose thickened; ill-defined flush on cheeks	Coarse and dry, much fat	Fulness in this region	—	Hands misshapen; skin on dorsum rough	—	Hair comes out every time she combs it	Not to be felt	Subnormal, 97° to 98·4°	—	—	No œdema	—	—	—	—	—	—
103	Suckling	Mrs. H.	56	F.	Working class	Mother died of phthisis; father had pleurisy; sister (S. K., case of Dr. Hopkins) has myxœdema	No	No	Considerable trouble and worry	Ceased at 47	3; 1 a miscarriage	2, both alive; not born after establishment of myxœdema	54	Eyelids	A big woman	—	—	Clear and translucent; face large and œdematous; œdema of both eyelids, especially the lower; lower lip thick, pendulous and cyanotic	Dry and scurfy	Puffy; great prominence	—	Dry and does not perspire; hands not spade-like	Normal	Scanty; has come off much lately	Not to be felt at present; she says that it has been large	—	—	99° in mouth	None	—	Normal	Normal	—	Complains of feeling cold	[illegible]
104	[illegible]	—	47	F.	Machinist	Father died of diabetes, mother of dropsy	Yes, 15 years ago	No	Yes; has had great mental anxiety	Ceased	6 (2 miscarriages)	4 born alive, now dead; born before establishment of myxœdema	36	Face and eyelids	Born in Wolverhampton; now in Birmingham Workhouse Infirmary	Stoutish	10 st. 12 lbs.	—	Translucent, with pinkish tinge on each cheek; face looks œdematous, like that of chronic renal disease, but does not pit	Dry and scaly	Puffy and swollen	Normal	Swollen, but do not pit	Normal	Scanty and dry	Was large, but is now small	97°	95°	97·5°	No pitting, no ascites	Power of distinguishing two contact points impaired; localisation not impaired	Slight analgesia	Yes, markedly	Normal	None	[illegible]
105	Suckling	—	50	F.	Working class	No important facts	No	No	Has had great family grief	Menopause 7 years ago	11; 1 a miscarriage	10; 5 died of scarlet fever; none born since establishment of myxœdema	48	Face and hands	Tipton	—	—	Face markedly puffy, especially lower eyelids, which pit on pressure	Dry, translucent, and harsh	—	Markedly puffy	—	—	Normal	Scanty	Small now	Normal	—	—	Marked pitting of lower eyelids, nowhere else	—	—	Yes	—	Weariness, and pains in hands and feet	[illegible]
106	Thaon	M.	40	F.	—	—	—	—	Yes	Regular, abundant, painful	—	1	—	—	Born in Ionian Islands, lived in London later, and then in France	—	—	Expressionless, mask-like	Eyelids semi-transparent, porcelain-like; red flush on cheeks; alæ nasi thickened, livid; lips swollen, everted	Dry, scaly, no perspiration or sebaceous secretion	—	—	Very large, misshapen hands, massive and swollen; feet big and awkward; skin hard	—	Absent from pubes and armpits	—	—	—	—	No ascites	—	—	—	—	—	—
107	Whipham	—	20	F.	Single	Father drowned; mother died soon after patient's birth; cause unknown	No	—	—	From æt. 17 always irregular	—	—	18	—	Millbank Street	—	—	Heavy, apathetic	Pale red tip to nose	Dry, dead white colour, thick	—	—	Hands red; skin dry, harsh, and thick	—	Red, growing low on forehead, scanty; up to 3 years ago more abundant	—	Till fatal illness never above 98·2°; while under observation often as low as 96·2°; average slightly above 98°	—	—	Ascites 3 or 4 years ago; œdema of legs; puffiness of face; ? pitting	—	—	—	—	Coldness of feet and hands	[illegible]
108	Whipham	—	41	F.	Married (æt. 19)	Mother consumptive; all other relatives healthy	No	—	No	—	2	2; one died, æt. 14; one æt. 2½, cause unknown	35	Feet	—	—	—	Heavy dull aspect	Upper and lower eyelids semi-transparent and swollen; permanent patches of dilated capillaries over both malar bones	Dry, and liable to crack	—	—	Legs swollen; feet œdematous; skin dry and liable to crack	—	Falling for 2 months before admission	Could not be felt	Usually about 97°; twice 98°, once 100°, and once 96°	—	—	Ascites; pitting of feet	—	—	—	—	Frequent feeling of chilliness	—
109	White	A. R.	59	F.	Wife of blacksmith	Father died suddenly at 80, cause unknown; mother at 75 of heart disease; 1 brother suffered from liver trouble; 1 sister starved herself; 1 sister alive	No	No	Yes, domestic worry	Ceased at 43	3	3; 2 alive; 1 died of diphtheria; none born since onset of myxœdema	55½	Face	Dover; now at Kent Lunatic Asylum (Chartham)	—	July, '81, 8 st. 11 lbs.; Apr., '82, 10 st. 1 lb.; Feb., '84, 9st. 8lbs., appears increasing now	Dull, apathetic, renal-like; expression sad and vacant	Anæmic, œdematous looking, waxy; cyanosis of lips; flush on cheeks; nose flattened	Dry, scurfy, glazed, waxy; cyanosis here and there	Slight fulness	—	Œdema of upper part of thighs, not pitting; hands slightly enlarged; wedding ring cannot be removed; xerodcrma of elbows, heels, and soles	Transverse thickening of most	Lank, brown, dry and scanty on vertex; eyebrows deficient; very scanty in axillæ and pubes	? Slightly below normal size; says she had enlarged glands in neck 4 years ago	93·6°	Subnormal	In mouth 94·4°	Slight œdema of feet at times, none recently	No	No	Slightly	Cannot distinguish	Better tastes in the mouth decayed odours	[illegible]

TABULATED CASES OF MYXŒDEMA—*cont.*

Sensation.					Motion.				Convulsions.	Reflexes.		Intellectual changes.														Circulatory system.				Respiratory system.
	Perverted.	Delayed.	Of heat and cold.	Subjective sensations.	Occipital headache.	Paralysis.	Paresis.	Retardation.	Inco-ordination (falls, injuries thereby).		Superficial.	Deep.	Slowness.	Abnormal persistence in thought and action.	Imperfection or perfection of mental processes.	Writing.	Irritability.	Sleep.	Delusions.	Hallucinations.	State of memory.	Insanity.	Agoraphobia.	Changes in speech.	Eyes and vision.	Ears and hearing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins	Capillaries.	
—	—	—	—	—	—	—	—	—	—	—	—	—	In thought	Perfection	—	—	Good	Thought that she was accused of saying bad things	—	—	—	—	Slow, rather gruff, distinct	Pupils equal	Very deaf	—	—	—	Sounds feeble, but healthy	—	—	Congested on face and legs	—
Normal	Normal	—	Complains of feeling cold	No	No	No	Yes	Had a bad fall about 6 months ago	No	Diminished	Knee-jerk present and normal	Yes	—	—	—	No, placid	? Good	No	No	Bad for recent events	No	No	Speech slow; when she talks she feels a difficulty, as though her tongue would not move	Normal	Normal	Normal	Normal	—	Normal	Pulse 60	—	—	Normal
Slight analgesia	Yes, markedly	Normal	None	Severe	No	No	Yes, slow in movements	No (?); fell and fractured right patella 3 months ago	Two convulsions lately	Plantar can be obtained	Patellar tendon-reflex diminished; no ankle-clonus	In answering questions	No	No imperfection	Slow and unsteady	Not usually, generally remarkably placid	Sleeps badly	Yes	Of vision at times; sees her friends in the ward	Defective	Two or three attacks of mania; was greatly distressed, excited, incoherent; quite rational now	—	Slow and slurred	Normal	Normal	Normal	Normal	Normal	Normal	Pulse slow, 60	—	No capillary pulsation	Breathing slow and jerky, prolonged expiration
—	Yes	—	Weariness, and pains in hands and feet	Formerly severe	No	No	Yes	Clumsy; has had several falls	No	Normal	Normal	In thought	In action	—	Normal	Yes	—	No	—	Bad	—	Yes, marked	Delayed, slow and slurred	Normal	Normal	Normal	Normal	Normal	Normal	Normal, pulse 60	Normal	Normal	Normal
—	—	—	—	—	—	Yes, especially of muscles of neck	—	—	—	—	—	—	—	Imperfection after onset of insanity	—	—	Has had dreams; wakes startled	—	—	—	—	—	Thick, nasal, monotonous	Good, pupils normal	—	—	—	Pale; no increase in white corpuscles	Normal	Hæmic bruit in vessels of neck	—	—	Normal
—	—	—	Coldness of feet and hands	Occasionally severe; on two occasions was deaf, and screamed for about 15 minutes while suffering from the headache	None	None	—	None	None	—	—	—	—	—	—	None	Often disturbed by abdominal pain	None	None	—	None	None	Thick, slow, indistinct	Normal	Normal	Normal	Normal	—	2nd sound accentuated	Pulse usually slow, 48 to 56, occasionally 64 to 80	—	Dilated on nose	Respiration 25 a minute, broken sighing
—	—	—	Frequent feeling of chilliness	—	None	None	—	Severe fall 10 months before admission	—	—	—	In apprehension	—	—	—	None	Nothing abnormal	None	None	Good	None	None	Slow, always has been	Normal	Normal	Normal	Normal	—	1st sound reduplicated; action weak	Pulse 80 to 92	—	Dilated over malar regions, have been so from childhood	Normal
No	Slightly	Cannot distinguish	Bitter tastes in the mouth; disagreeable odours	Formerly but not of late	No	No	Marked; gait tottering	No	No	Normal	Normal	Yes, of thought	No	Perfection, except when misled by delusions	Could write formerly, cannot now	No, very placid	Used to sleep very much until recently	—	Hears voices of departed spirits, and hears tappings, especially at night; sees moving shadows at night	Fairly good	Delusional, chronic mania	None	Slow and deliberate	Eyes sunken, pupils contracted, vision fairly good	Ears very anæmic, waxy, and translucent; deaf at times	Nose flat and broad; alæ nasi thickened; smell perverted	Perverted; frequently bitter	—	Sounds normal, distant; no increase of dulness	Thickened; pulse 52 to 60, small, regular (tracing given)	More or less congested on surface	Dilated here and there on surface	Respiration 10 to 14 a minute, irregular, hesitating, broken, sighing

			Circulatory system.					Respiratory system.	Digestive system.						Lymph glands.	Urinary system.								Sexual system.	Occurrence of crises.	Other diseases present.	Progress of case.	Mode of dying.	Wasting or change in character of dropsy before death.	Treatment and its effect.	Additional information.	
and ing.	Nose and smell.	Taste.	Blood.	Heart.	Arteries.	Veins.	Capillaries.		Deglutition.	Teeth.	Gums.	Tongue.	Uvula and soft palate.	Defæcation.		General state of urine.	Quantity.	Specific gravity.	Re-action.	Albumen.	Urea.	Colour.	Micturition.								
deaf	—	—	—	Sounds feeble, but healthy	—	—	Congested on face and legs	—	—	—	—	—	—	Constipation	—	Phosphates	30 to 44 oz.	1018 to 1024	Acid	Trace twice	—	Reddish yellow	—	—	—	—	—	—	—	Purgatives only	A week under observation. ('St. Thomas's Hospital Medical Notes for 1884.')	102
nal	Normal	Normal	—	Normal	Pulse 60	—	—	Normal	Normal	No teeth for last 3 years	Wasted	Large and pale	Normal	Normal	Normal	Clear	3 pints daily (scanty on day of examination)	1024	Acid	None	—	Pale yellow	Micturates 2 or 3 times in the night and frequently during the day	—	—	—	—	—	—	—	(Unpublished.)	103
sal	Normal	Normal	Normal	Normal	Pulse slow, 60	—	No capillary pulsation	Breathing slow and jerky; prolonged expiration	Normal	Bad, has lost many	Pale	Large and furred	Normal	Constipation, otherwise normal	Normal	Clear	Averages 50 ounces, varies daily	1010	Acid	No	Diminished, 3·9 gr. to ounce	Pale	Normal	Normal	None	None	No change during last 16 months	—	—	Nitro-glycerine m½ of 1 p. c. sol. twice daily for a month; she said it did her good, facilitating her movements; no evident alteration. Pilocarpin caused sweating, and with similar result	('Brit. Med. Journ.,' April 14th, 1883.)	104
al	Normal	Normal	Normal	Normal	Normal, pulse 60	Normal	Normal	Normal	Normal	Nearly all gone	—	Large	Large	Normal	Normal	Clear	Normal	1016	Acid	No	—	Normal	—	—	—	—	—	—	—	—	Salivation at night; saliva dripping from the mouth, and wetting the clothes. Since dead. ('Birmingham Med. Rev.,' March, 1884.)	
	—	—	Pale; no increase in white corpuscles	Normal	Hæmic bruit in vessels of neck	—	—	Normal	—	Loose	Red and swollen	Too large for the mouth	Uvula large	—	—	—	Abundant	1016	—	None	—	Pale	—	—	—	—	—	—	—	Improvement under treatment at Aix-les-Bains and Nice	('Revue Mensuelle,' Aug., 1880.	106
al	Normal	Normal	—	2nd sound accentuated	Pulse usually slow, 48 to 66, occasionally 64 to 80	—	Dilated on nose	Respirations 18 a minute; nothing abnormal	Nothing abnormal	Much notched, especially lateral incisors and bicuspids, which were concave	—	Nothing abnormal	—	Normal	Normal	Uniformly turbid; cloudiness not increased or diminished by caustic potash, acetic or nitric acid. On boiling a thick deposit cleared up with acid to about the state of the unboiled fluid	In excess for several years	1026	Acid	Trace occasionally until onset of pneumonia, when more	—	Pale yellow	Normal	—	—	—	Improvement in general health till fatal pneumonia; œdema of legs disappeared	Pneumonia; death sudden (Aug. 16th, 1883)	—	Citrate and nitrate of potash, iodide of potassium, iron, and nux vomica. Paracentesis abdominis. No reaccumulation of fluid afterwards. Improvement in general health	Patient had rickets in early life, and had had smallpox. ('Med. Soc. Proc.,' vol. viii.)	107
l	Normal	Normal	—	1st sound reduplicated; action weak	Pulse 80 to 92	—	Dilated over molar regions; have been so from childhood	Normal	—	—	—	Red and raw while suffering from diarrhœa in hospital	—	Nothing abnormal	Normal	Turbid from excess of mucus	Very scanty, 8 to 24 oz.	1018	Acid	None	On one occasion (Dec. 8th, 1883) 135 grs. in 30 oz.	Light amber	Normal	—	—	—	Slight improvement	—	—	Paracentesis abdominis. Kino, Acid. Sulph., bark and a little opium for the diarrhœa. Slight improvement in general health. Recurrence of ascites	(Unpublished.)	108
y nd st; nes	Nose flat and broad; alæ nasi thickened; smell perverted	Perverted; frequently bitter	—	Sounds normal, distant; no increase of dulness	Thickened; pulse 52 to 60, small, regular (tracing given)	More or less congested on surface	Dilated here and there on surface	Respirations 10 to 14 per minute; lungs healthy; bronchitis once	Normal	Most are gone, the three or four remaining are loose	Receding and œdematous	Large, healthy in colour	Pale, flabby, œdematous	Normal	Normal	Opalescent from mucus. Parts per 1000: uric acid = ·91; phosphates as P_2O_5=1·74; chlorides as NaCl=7·69; sulphates as SO_3=2·21; no sugar	Average for 4 days 29½ oz.	1011 to 1012	Very acid	None	10·11 in parts per 1000 (by hypobromite method with precautions)	Pale	Normal	—	None	Has had bronchitis and two attacks of diarrhœa	The myxœdema has become progressively worse	—	—	Iron, slight improvement; jaborandi quite recently	Erysipelas in the face soon after œdema was noticed there. Since dead. ('Lancet,' May 31st, 1884.	109

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